

March/APRIL, 1984

SCUBA TIMES

VOL 5, No. 2

The Active Diver's Magazine

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FROM THE EDITOR

SCUTTLEBUTT

The most memorable class session of my basic scuba course was the night the Head Sea Worm demonstrated the buddy system. Earlier in the evening he had acquainted us with the theories and principles behind buddy diving. So all we had to do was stick close to our buddy and nothing would ever go wrong. If it did, he/she would come to our rescue. Theoretically.

Then Head Sea Worm spread the folding chairs we were using around the classroom. I was in the back, and he hung a regulator around my neck. Other classmates were given valves, pipes and other souvenirs to hold -they were the wreck.

Head Sea Worm gasped. He moved his finger wildly back and forth across his throat. He bugged out his eyes in the best imitation of panic this side of a Brian de Palma movie, and headed straight for me-through two students, several folding chairs, and a few salvaged pieces of wreckage. Once he reached me, he took the regulator from me and refused to give it back.

He made his point.

He went on to explain all the pros and cons of the buddy system-and there are plenty of both. And there are as many theories about it as there are divers. Some dive within hand-holding distance of their buddies at all times; at the other extreme are those who take a boat to sea, or drop off the beach completely alone. Most of us seem to be somewhere in the middle.

Where are you? What are your feelings about the buddy system? Is it the safest, the only way to dive, or does it breed a false sense of security?

Send your opinions to Cross Currents, Scuba Times forum, by May 15. They will appear in the July/August issue. Letters should

be typed, double spaced, and be signed with your name and address for verification. We reserve the right to edit for clarity and length.

Cross Currents will debut in the May/June issue. There's still time to send your thoughts on wreck diving regulation.

For those of you who live in cooler climates, who are eagerly awaiting the beginning of the diving season in the next few months, we bring good news: There's a way to extend your season. In this issue we take a look at drysuits, both from an expert's point of view and that of a first-time user.

If you're among those who believe that if it's cold enough to use a drysuit, it's too cold to be there in the first place, we take you to some warmer places. With this issue, visit the Cayman Islands, three tropical paradises each with a unique flavor. We also take you to Ras Muhammad in the Red Sea, where well-known scientist Dr. Eugenie Clark has lobbied successfully for creation of a marine park, and photographer R. Ingo Reipl captured one of the resident sharks.

Speaking of photos, find out about an organization which not only develops underwater shots, but helps shutterbugs market themselves, as well. Read all about it in Hot Shots, our underwater photography column.

We try to pack Scuba Times with the best underwater photography and features on the places you want to visit, the dives you want to make. But it's your magazine--let us know what you want to see in these pages. If there's a place you want to know more about, tell us. We'll try to tear ourselves away from the office long enough to investigate it for you.

In the meantime, good divin'!

-Cathie Cush



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SCUBA TIMES is published bi-monthly with issue months of January/February, March/April, May/June, July/August, September/October, November/December.

ON THE COVER: A living cloud of silverside minnows descends each summer in the caverns of Devil's Grotto, a maze of coral just off shore in Georgetown Harbor, Grand Cayman. Photographer Dickie Walls captures Phyllis Cathey in the midst of this unique wall of life.

THE ACTIVE DIVER'S MAGAZINE

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Features

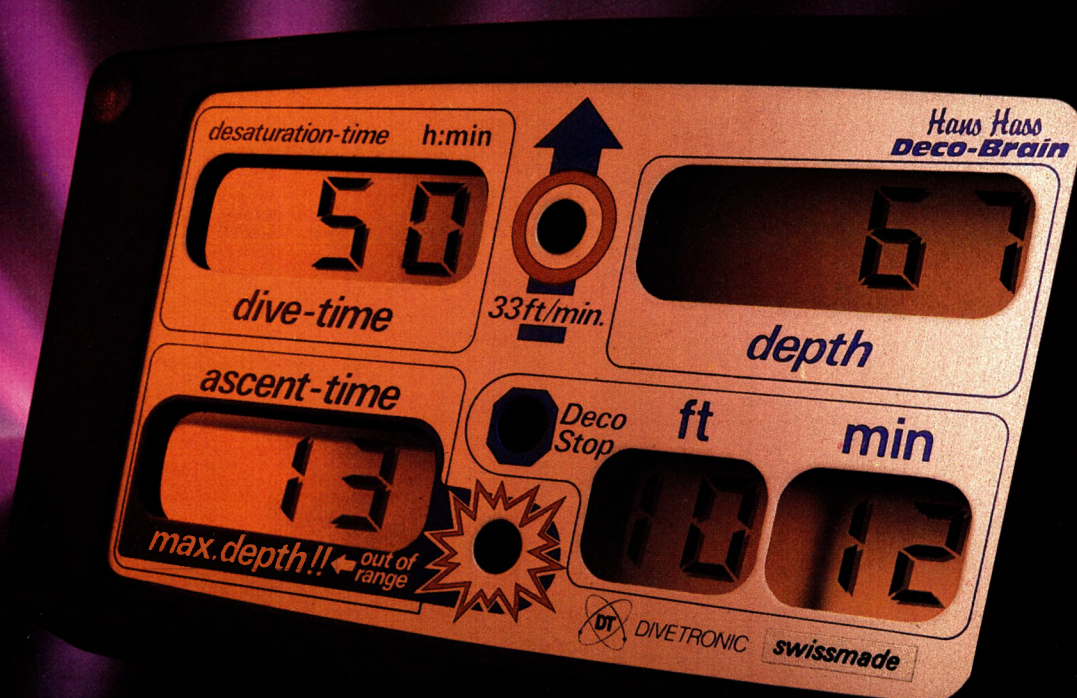
- NOAA STAYS DRY: Experts Examine Drysuit Performance** 10
An objective look at the drysuits available on today's market, and the results and recommendations of a NOAA study. By R. G. Williscroft, Ph.D.
- DON'T BE ALL WET! Dive Dry!** 18
A humorous and candid look at the realities of drysuit diving by a first-time drysuit wearer. By Cathie Cush
- EAST END: The Other Side of Grand Cayman** 25
Grand Cayman's East End sits in placid contrast to the rest of the island, a scuba diver's oasis with just a hint of civilization. By Robert Holland
- THE CAYMANS: Three Islands Where Time's Out of Mind** 28
Tranquil waters, sparkling beaches and charming inhabitants of Grand Cayman, Cayman Brac and Little Cayman qualify them among the world's top four diving destinations. By John C. Fine
- LIFE AMONG THE SHARKS: Mingling with Ras Muhammad's** 34
Unique underwater confrontations with these fierce and fascinating creatures. By R. Ingo Riepl
- SAVING THE RED SEA: An Ecological Victory** 38
The stark yet strikingly beautiful Ras Muhammad area of the Red Sea has become Egypt's first national park--and part of the country's new outlook on conservation. By Cathie Cush
- ADVENTURE IN THE NORTH: What a Wreck!** 44
With numerous battleships and cruisers resting on its floor, Scapa Flow in the Orkney Islands off Scotland's mainland is quickly gaining a reputation as *the* cold-water shipwreck diver's paradise. By John C. Fine.
- SCUBA CHROME INTERNATIONAL** 58
Lab services for the underwater Photographer. By Lynn Russell.



Departments

- Editorial** 4
In this issue. By Cathie Cush
- Doctor's Orders** 16
Hypothermia: The Effects of Cold-Water Diving. By Dr. Bruce E. Bassett, Ph.D.
- Diver's Lines** 22
Hot-off-the-press publications for divers and water lovers at large.
- Gearing Up** 42
The newest and most innovative SCUBA products
- What's Up** 43
An exciting collection of events to keep you involved in the diving community.
- Classified Ads** 46
- Dive Store Directory** 52
- Instructor's Column** 55
Diving Jitters: Why Unwarranted Fears aren't so Irrational By Walt Hendrick.
- Wet and Wild** 57
Moments: The making of the world's first R-rated diving film. By Bill Lovin.
- Creature Feature** 60





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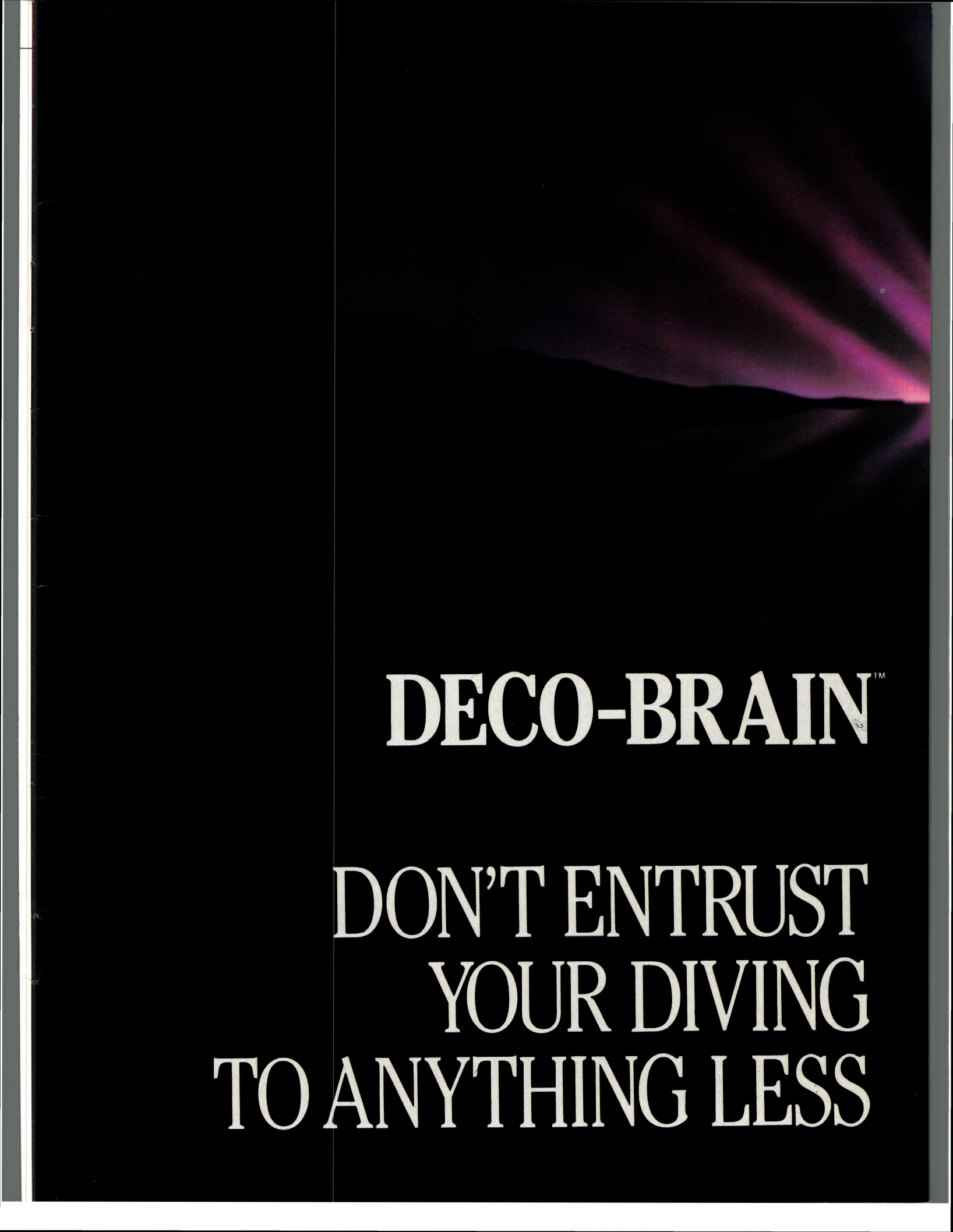
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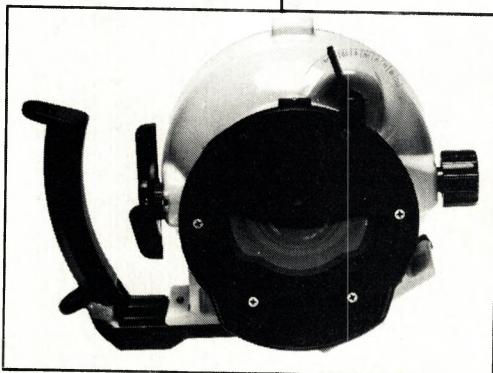
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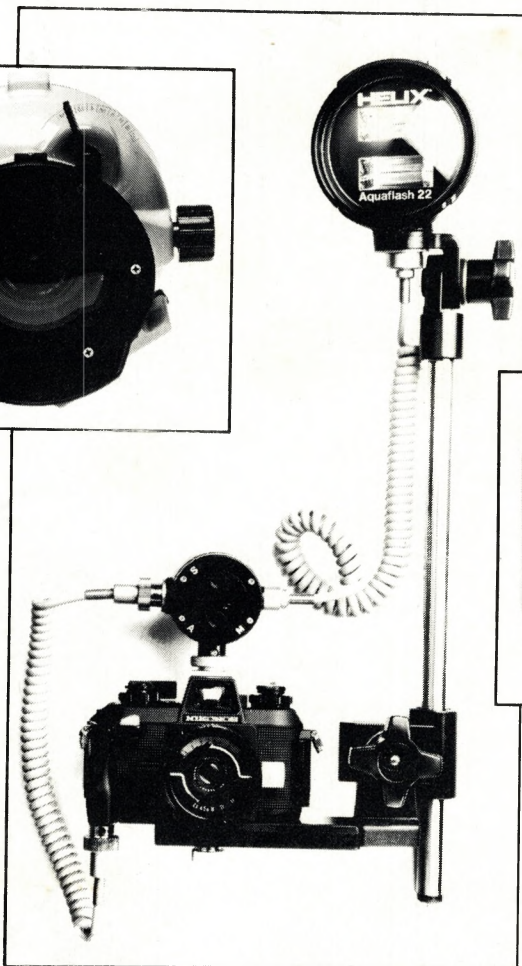
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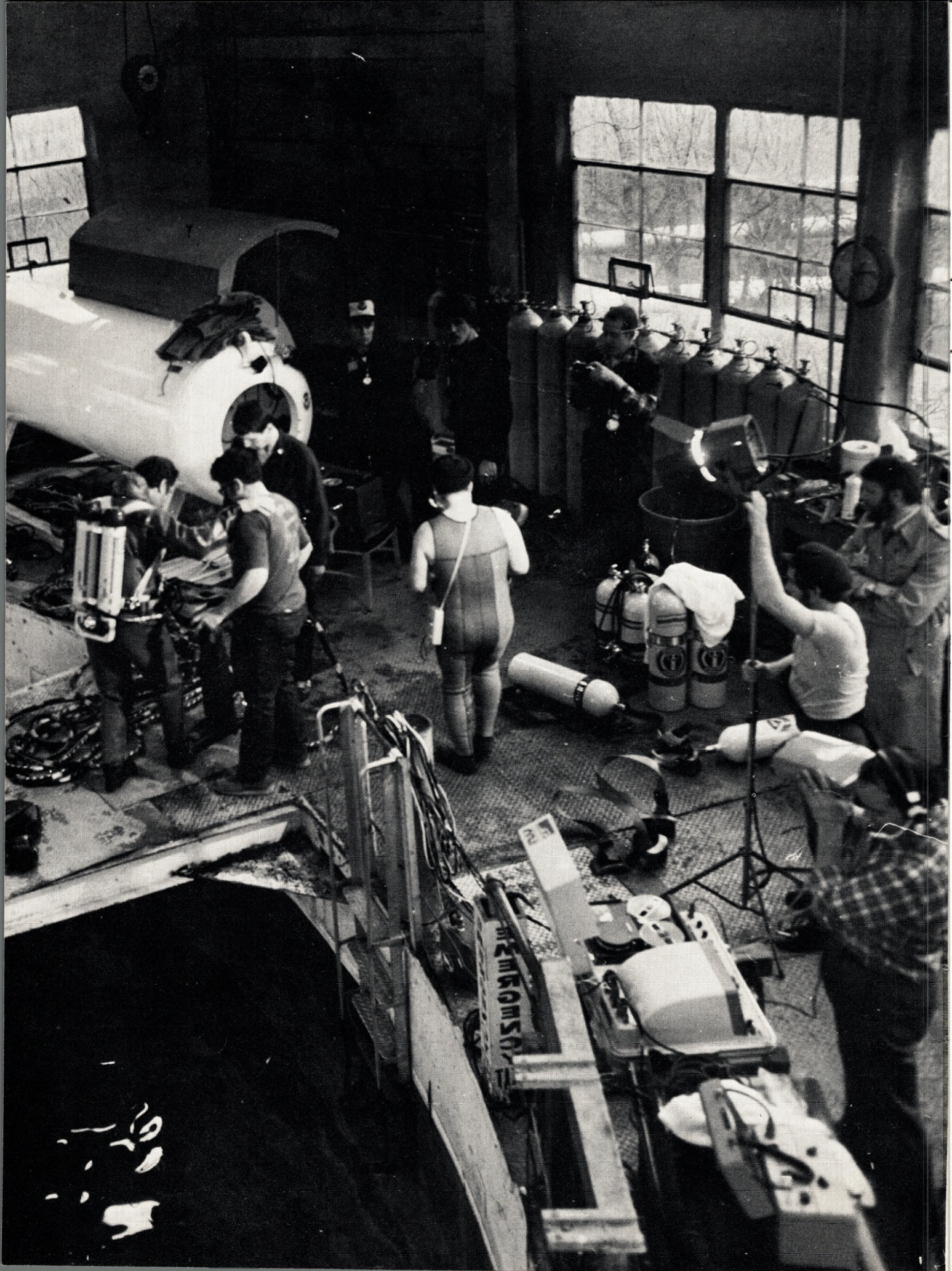
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STM





NOAA Stays Dry

Article by R. G. Williscroft, Ph.D.

Divers are all familiar with drysuit blow-up stories. In the course of a 1979 National Oceanic and Atmospheric Administration (NOAA) project to develop a system for protecting a diver in contaminated water, it became apparent that there was not enough available data on drysuit performance. My NOAA colleagues and I interrupted our polluted water diving research to concentrate on developing drysuit data. The rather surprising results of this study, especially as they relate to sport diving, are reported in this article.

Tests were made at the Naval Surface Weapons Center Diving and Testing Tower at White Oak, Maryland. The cylindrical tank is 100 feet deep and 50 feet in diameter, and holds 1.5 million gallons of water. A platform that can be set at any depth covers the entire cross section. The walls have graduated depth markings and underwater lights.

Twelve divers, some of the foremost members of the NOAA diving community, participated in the study, including such illuminaries as Dr. J. Morgan Wells, his assistant, Dick Rutkowski, from the Miami NOAA Diving Facility, and Bill High, known to many divers for his NAUI leadership.

These gentlemen were collectively divided as to how a drysuit would react under different circumstances. Rutkowski was present during NOAA's only diving fatality--an apparent blow-up in a drysuit. Each of the divers was

Photo: John Roseborough

experienced in the suits. Each was a seasoned instructor of professional divers, and each had a mind of his own and was quite willing to express his opinion as often and as loudly as necessary.

The divers were to look at suit buoyancy characteristics as a function of other equipment. In other words, how much weight is needed, and what happens when that weight is lost? What causes blow-ups and how can they be prevented? Can a diver recover from a blow-up? What happens when a suit floods? What are drysuit thermal and mobility properties? The divers agreed to develop a training procedure that would take into account what had been learned during the study.

The Suits

Drysuits fall into several categories. First, there are neoprene and non-neoprene suits, and Diving Unlimited International's CAT Suit, made of a crushed neoprene foam. My research indicates that CAT Suits belong in the non-neoprene suit category. Non-neoprene suits are either variable or constant volume. Variable volume suits stretch; constant volume suits do not. Two general categories are loose-fitting and snug drysuits. Any drysuit can be fitted into one of these groups.

When this study took place, the suit most often purchased within the NOAA diving community was the Poseidon Unisuit. (This should not be taken as an endorsement by either NOAA or myself.) This one-piece suit is constructed of 1/4-inch closed-cell neoprene foam material, very much like standard 1/4-inch wetsuit material. A waterproof zipper runs from the back of the neck, under the crotch, and up to the waist. Boots and hood are attached. A nylon outside, smooth skin inside neoprene cuff at the wrist, and a thin neoprene collar pulled down around the neck, seal the suit upon contact with the diver's skin. A push-button inlet valve on the right of the diver's chest and an exhaust valve on the left provide buoyancy control. This loose-fitting neoprene suit allows the wearing of additional thermal protection undergarments.

The other neoprene suits included in the study, the Poseidon Jetsuit and the Imperial Bubble Suit, are both typical of the snug-fitting drysuit. They are constructed of a material similar to the Unisuit, but have across-the-shoulder

entries. A hose entering the center of the chest, used for buoyancy control, may be inflated orally or by using a low-pressure hose from the regulator first stage. Deflation is somewhat awkward--the hose must be held so that air can escape without letting water into the suit. During the study all suits of this type were refitted with Unisuit-type valves, thus eliminating this problem. This eliminated the oral inflation option also, but that was not considered a serious loss.

The Viking Suit, a loose-fitting, non-neoprene, constant volume suit, differs quite a bit from the other suits tested. The rubber-covered canvass suit has attached boots and rubber wrist seals. A neck dam and/or hood can be attached to a neck ring as the situation dictates. Current sport versions of this suit have eliminated this, permanently attaching the neck seal and hood to the suit. The suit has an across-the-shoulder entry. Inflation is through a Unisuit-type valve on the left chest; an adjustable deflation valve on the left arm can be set to exhaust at any given over-pressure.

A more recent example of this category of suit is the shell suit, which consists of a completely waterproofed, lightweight nylon shell, sealed at wrist and neck with thin latex rubber. The boots usually are also made of latex rubber, more like socks, and require some kind of external protection.

The Tests

In addition to the 45 test dives that were part of the study, 90 to 130 additional dives allowed divers to acclimate themselves to the equipment and the tower environment. These practice dives generally preceded actual test exercise dives.

Most of the tests looked at what would happen to a diver who suddenly found his suit filled with air, or himself insufficiently weighted. This could cause a rapid ascent to the surface with the ensuing risk of gas embolism. The initial positive buoyancy would cause the diver to rise, decreasing the water pressure around him, causing his suit to expand, displacing more water, increasing his positive buoyancy, causing him to rise, and so on, snowballing towards the surface.

In the first variation, simulating weight belt loss or accidental suit inflation, a neutrally buoyant diver ditched his weight belt and ascended to the surface. The question was,

Photo: John Roseborough



Previous Page: White Oak Tower Operations Deck. Above: The Viking Suit.

"How quickly does he ascend, and can he control his ascent?"

In a second test, a neutral diver ditched his weight belt, air tank and breathing apparatus, and ascended to the surface. This variation simulated a diver in distress ditching everything he can in order to surface without hinderance.

In the third variation, a neutral diver inverted, ditched his weight belt, and while ascending attempted to recover and return to depth without reaching the surface. There was concern that an inverted diver who accidentally inflated his suit or lost his weight belt would find his feet inflated and be unable to turn his body around in order to dump air through his exhaust valve or neck and wrist seals.

A diver experiencing one of these situations might risk a potential embolism. Therefore, it was important to find out what options were available. It must be stressed that these were controlled tests, under close supervision, by highly experienced divers. A chamber and expert medical care were immediately at hand. Under no circumstances should a diver attempt to duplicate these tests on his own. He would be risking his life!

A diver can control his underwater buoyancy in a drysuit without using a BC. Expert opinion within NOAA was divided on whether a BC should be worn with a drysuit. Some feared that an inflated BC might interfere with proper operation of suit valves and so

Experts Examine Drysuit Performance

cause an unexpected ascent with the resulting risk of embolism. To test this, a neutrally buoyant diver wearing a BC ditched his weight belt and ascended to the surface. No problems were encountered.

Another potential risk is drowning should the suit flood and the diver be unable to reach the surface. To test this situation a diver deliberately filled his suit with water and then attempted to reach the surface without using buoyancy air in his suit.

A number of the divers had found that two-pound lead straps attached to their ankles while diving in a drysuit significantly increased their ability to control body attitude in the water. These weights, however, could not be removed easily under emergency circumstances, so the test series was run both with and without them to determine whether they significantly affected ascent.

Results

The data were collected and analyzed. In many cases, exotic statistical tests had to be applied to determine whether measured differences were real or simply artifacts of the test procedures. Results are summarized here.

Free ascents from deeper depths are slower than free ascents from shallower depths. Although there is a slight difference between ascent rates with and without tanks and regulators, the difference does not justify abandoning these items in an emergency.

With proper training, it is possible to recover from an inverted blow-up, either making a controlled ascent to the surface, or returning to depth and continuing the dive. The use of ankle weights facilitates the recovery, and slows the ascent by about 10 percent. When ankle weights are used under other circumstances, however, they *increase* ascent speed, because the body is more vertical, and so the flare is somewhat less effective. On balance, when compared to the advantage offered by ankle weights in recovering from an inversion, they should be worn.

Recovery from an inversion can be accomplished in the first 15 feet of ascent. Depending on the diver's position when the blow-up occurs, he either tucks forward from the waist, kicks downward strongly, rolls over, and vents his suit. With practice, any diver can learn to do this, and once these principles are learned, they become as instinctive as balancing while walking.

A BC does not significantly affect ascent rate, but when worn, it must not interfere with operation of suit valves. A diver contemplating spending any time on the surface in a non-neoprene suit should definitely wear BC, or have other adequate flotation available.

In general, a constant volume suit provides the slowest ascent, (e.g. Viking or shell suit); the loose fitting variable volume suit the next slowest ascent (e.g. Unisuit, CAT Suit), and the snug type the fastest (e.g. Jetsuit,

Bubble Suit), all other factors being equal.

It is possible to swim to the surface in a fully flooded drysuit, regardless of suit type. The ascent will be faster and easier in any neoprene suit than any non-neoprene suit. Therefore, it probably is safer to use a BC when diving in a non-neoprene suit, since they require a BC for resting on the surface and are considerably more difficult to swim to the surface in when flooded. A BC gives them an added margin of safety.

Neck, wrist, and face seals must fit snugly to ensure a dry dive. They tear easily and cannot be repaired when wet. Long hair can interfere with operation of neck seals.

Neoprene suits offer enough thermal insulation that a diver will overheat in water warmer than 65 degrees Fahrenheit. In non-neoprene suits this problem is avoided by decreasing the amount of undergarments worn.

As might be expected, the bulkier suits are more tiring to swim in and suits with a smoother exterior offer less resistance to the water.

Recommendation

The following recommendations are the result of this study and subsequent field tests conducted on both coasts. They probably are not all inclusive, but the divers who participated in these tests and I believe that they summarize the most important considerations for an individual wishing to use a drysuit.

Any diver who obtains a drysuit should learn emergency blow-up procedures *before* he uses the suit. These procedures should include inversion swim-out, valve malfunction, weight belt loss, and suit flooding conditions. Ideally, the initial suit orientation should be in a pool under very controlled conditions. The final work should be actual diving conditions in open water, but still supervised, of course.

Ankle weights of about two pounds each should be worn to facilitate inversion recovery and to help prevent fin loss from leg blow-up. Two types are now available. One is a narrow lead strip held in place with rubber straps. The other is a tube of nylon stretch material filled with lead shot secured by plastic, quick-released

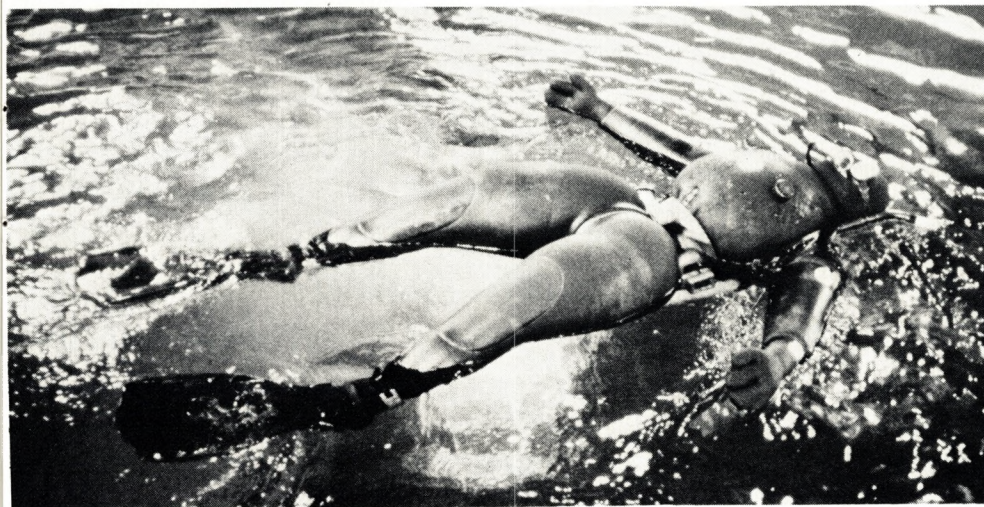


Photo: R. G. Williscroft

A diver on the surface after free ascent without flare or vent.

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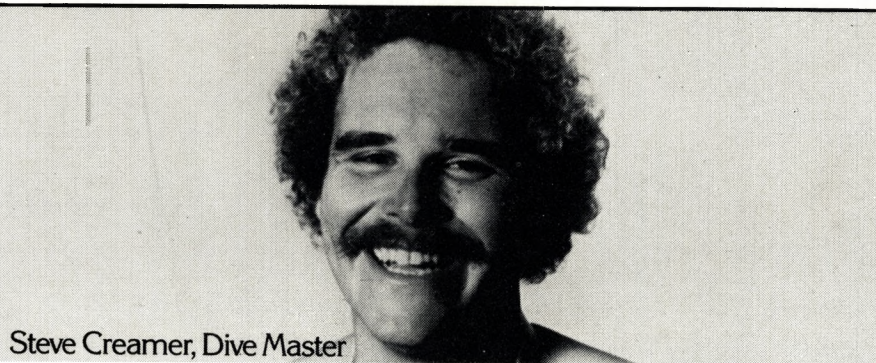


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Hypothermia:

The Effects of Cold-Water Diving

By Bruce E. Bassett, Ph.D.

As warm-blooded animals (though some may have cold-blooded natures), divers and other human beings don't tolerate decreases in body temperature very well. Since all body functions are based on chemical reactions whose rates are dependent upon temperature, it's not surprising that drops in body temperature can have serious to lethal effects.

The human body tries to protect itself--particularly the critical functions of the nervous and cardiovascular systems--from damage caused by a variety of things. Built-in mechanisms respond to cold exposure and drops in body temperature. There is a tremendous range of responses to cold between different people at the same water and air temperature, and other factors influence an individual's tolerance from day to day. With this basic information in mind, we'll look further at the effects of and responses to hypothermia.

Water Versus Air

At the same temperature, heat is lost in water much faster than in air because of water's greater thermal conductivity (25 times) and specific heat (1,000 times). This is why you may have seen divers (or been one) shivering after long or repetitive dives in what we call "warm" Caribbean or other tropical waters. Remember that body heat is lost whenever the surrounding temperature is less than body temperature (98.6 degrees Fahrenheit). The rate at which it is lost is influenced by the body's insulation--both natural body fat and clothing.

Built-in Insulation

Fat has a lower thermal conductivity than muscle. The fat diver (especially if his fat is concentrated just beneath the skin) is better able to tolerate cold water than his lean, muscular buddy. Other factors can offset or add to the protective effect of fat. For example, women, who in general have a higher distribution of fat than men, also have a greater surface area to total body mass ratio. The thermal disadvantage or being curvaceous means that women may chill faster than their

similarly-sized male counterparts of equal mass.

Blood Flow

Perhaps the most important initial response to cold is constriction of blood vessels (vasoconstriction) in the skin and other peripheral tissues. This response to cold differs in different body regions. For example, there is an absence of vasoconstrictive response in blood vessels of the head and face -- which is why your cheeks may be red (indicating high, not low, blood flow) on exposure to cold. This is also why keeping the head warm is most important in exposure to cold. Other areas with poor vasoconstriction include the neck, the sides of the trunk, the armpits and the groin. People hug themselves in the cold to reduce heat loss from these vulnerable areas.

Exercise

In cold air people need less clothing to maintain a constant core body temperature when exercising than they do at rest. The more exercise, the less insulation. However, this is not the case with cold water exposure.

Exercise in water temperatures of both 41 and 59 degrees Fahrenheit caused a greater fall in rectal temperature over that encountered at rest. At 77 degrees, there was no difference with or without exercise, and only at the warmer temperature of 95 degrees does exercise produce a slight increase in core temperature (versus a mild drop at rest). The effect of exercise in cold water--the further lowering of body temperature--is not affected by clothing or agitation of the water.

Effects in Cold-Water Diving

Heat loss is more extreme the deeper the dive and with helium as the inert breathing gas. An important point in both sport and commercial diving is that heat loss may continue on the surface between dives (or may begin before diving), especially in cold, windy, wet environments. Therefore each successive dive becomes more hazardous for a diver.

If the diver is too "macho" to wear protective clothing AND is ignorant of the subtle, insidious nature of hypothermic stress, he may never be aware--or make others aware--of the problem which might be occurring.

Sudden immersion in water that's 41 degrees F or colder can lead to severely elevated blood pressure, gasping and uncontrollable hyperventilation and all the well known symptoms of tingling, tunnel vision and unconsciousness. Protective wet or dry suits will reduce the hyperventilation response, and an even better protective effect can be gained by "pre-cooking" (raising the skin temperature before immersion as by pouring hot--not scalding--water into the wet suit).

Other responses to cold include shivering, elevated blood sugar, increased release of adrenal hormones and increased heart rate. A critical effect of hypothermia is depression of the central nervous system that leads to poor judgment, confusion, depressed reflexes, lethargy and total incapacitation with eventual coma.

In terms of rescue and recovery of severely hypothermic individuals, it must be remembered that profound hypothermia protects the central nervous system against injury (blood flow is maintained at the expense of peripheral tissue for a longer period of time). Thus, individuals who have very nearly drowned in cold water have had full recovery even after 30 or more minutes of immersion.

When body core temperature drops below 86 degrees F the heart's activity is affected. Also, blood thickness increases, blood sludging occurs, and fluid is lost through damaged capillaries. Respiratory depression can also occur.

The signs and symptoms experienced by humans as a function of rectal temperature are as follows:

*At just below 98.6 degrees F, symptoms include cold sensations, reduced skin blood flow, increased muscle tension and increased oxygen consumption.

*At 96.8 degrees F, symptoms

include sporadic shivering, gross shivering in bouts, and further increase in oxygen consumption (2 to 5 times normal resting value).

*At 95.0 degrees F, symptoms mental confusion, impairment of rational thought, possible drowning, and a decreasing will to struggle for survival.

*At 93.2 degrees F, symptoms include amnesia, poor speaking ability, and reduced sensation and motions.

*Hallucinations and delusions, clouding of consciousness and rigid muscles. There is a 50% fatality rate in survival experiences.

*Between 89.6 and 80.6 degrees F, symptoms include heart irregularities, inability to perform purposeful movements no response to painful stimuli, loss of consciousness, lost reflexes, fatalities from ventricular fibrillation, and death.

Practical Considerations

When out of the water in cold environments, wool clothing (which retains its protection even when wet) should be worn--especially on the head. In the water, thermal protection is absolutely essential in water below 70 degrees F. Some degree of thermal protection should be used when the water temperature is less than 86.0 degrees F, especially for long or repetitive dives.

Neoprene wetsuits of increasing thickness or layers are most commonly used for thermal protection in sport diving. In the normal range of water temperatures encountered by sport divers (70-86 degrees F.) there is a lot of variation as to what degree of insulation is preferred to maintain thermal comfort. While hypothermia can occur in this temperature range, it generally takes longer to develop than the diver has bottom time available.

Dry suits are generally considered essential for thermal protection in arctic or ice diving. They are also preferred for deeper diving because they overcome the effect of Boyle's Law on reducing the effective thickness and insulating value of the air-filled cells of neoprene wet suits.

In cold water diving, planning should include shorter exposures on repetitive dives, longer surface intervals for rewarming, and provisions for protection and rewarming between and following dives. When hypothermia of any degree occurs, no further diving should be performed. Remember, a diver has not been adequately rewarmed until he starts sweating.

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Open to anyone over 16 years old, divers and non-divers, Project Ocean Search offers a choice of two 12-day projects: July 22 to August 2; or August 5 to August 16. All travel from San Juan, Puerto Rico, room and board, and program activities are included in the cost which is \$2050.

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Don't Be All Wet --

Dive Dry

Article by Cathie Cush

The best part about wearing a drysuit is taking it off. Seriously. You can't really appreciate the beauty of the diving dry concept until that awful moment back on the boat when you must once again expose your skin to the elements. Sometimes it's enough to make you wish you never got wet in the first place. Well...maybe not. But there must be a better way.

There is.

I didn't appreciate all this on my first drysuit "dive," which took place in an indoor community swimming pool in Ocean City, New Jersey. I had some apprehensions (Am I going to spend the next hour upside down? Is it true you can embolize in four feet of water? Why wasn't I a fourth grade teacher instead of a scuba journalist?), and the pool building was very well insulated against the chilly winds of a Northeastern autumn.

I looked at the 28-ounce polyester undergarment that came with the suit. "This is going to be a bear," I grumbled to myself. But although I wound up looking like a Navy blue teddy bear myself, the first layer was easy enough to don. I was starting to perspire. How unladylike. Now, what about the suit?

I had watched dive buddies struggle into neoprene drysuits, sometimes disappearing for ages under neck seals. "Too much work," I'd say as I slipped into my plush wetsuit, which went on like a pair of well-worn blue jeans. I pulled the new drysuit from its bag. Unlike my friends' suits, this one, by Off-Shore Diving Equipment, was not made of neoprene, but of heavy-duty nylon backed with polyurethane. Unlike a neoprene drysuit, this shell suit itself would

provide no warmth or insulation--only dryness. I dusted the latex wrist and neck seals with powder. If I wasn't in the suit and in the water in about 30 seconds, I was going to pass out.

I missed the 30-second cut-off, but had all my gear--from suit to snorkel--on in a minute or so. I waded into the water, cracking the neck seal to let excess air escape. As soon as I entered the water I cooled off enough to be comfortable. A basic scuba class was being held in the pool at the time. "That's a sharp-looking suit," one of the instructors said. Hmmm, maybe this wasn't so bad.

I cruised along the bottom of the pool cautiously, waiting to be doing involuntary headstands at any moment. Feet, don't fail me now.

I was almost disappointed. I didn't hurtle toward the surface ten

feet above me feet first and out of control. I didn't feel choked by the neck seal. I didn't blow up like the Pillsbury Dough Diver. So much for the horror stories. Drysuit diving was going to take some practice, but so far it wasn't a likely subject for the next Stephen King novel.

I had seen a handful of aborted drysuit dives, which is why I chose to spend some pool time with the suit before tackling the Atlantic. The difficulties I had witnessed were mostly the result of not knowing what to expect. In one case, the diver hadn't even tried the suit on completely before going into the ocean. When the neck seal tightened, it was Panic City.

Although a heated swimming pool provided a safe, comfortable, controlled environment where I could get a feel for the suit, chlorine loses its charm quickly. A good second step might have been



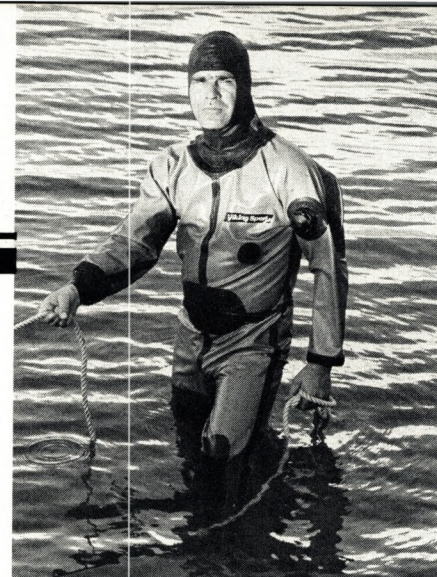
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a quarry or lake, but hell, the ocean was only a block away.

And so there I was, bouncing across the swells on my way to a wreck several miles off the Jersey shore in mid-October. A certified wimp diver, I don't normally choose to dive off New Jersey in October. I looked at the gray sky and felt the wind cut through a heavy sweatshirt, a flannel shirt, and a long undershirt. I should have stayed home and scrubbed the toilet.

We suited up in the warmth of the *Robin's* cabin, jockeying for position around the kerosene heater. Drysuits outnumbered wetsuits by 5:3. (In summer that ratio's reversed.) If it had been any warmer out it would have gotten pretty toasty waiting to make sure the anchor was secure, but at that point I wouldn't have been any cooler in a wetsuit. I looked at the assortment of suits around me and had to admit the guy in the pool had been right. My suit was sharp looking--maybe a little too much so for the macho crew on board. "Don't get near the wreck," the captain in his well-worn "semi" drysuit warned. "It'll never hold up."

Hold up? My next worry was getting down. Most of my buddies were wearing in the vicinity of 40 pounds of lead; I had 18--the same I wear with a full wetsuit. Off-Shore President Bruce Spangrud had promised me that eventually I'd need even less. I ignored one

skeptic's suggestion that I should have gone down holding on to the anchor, and rolled over the gunwale.

And down I went. Without the aid of neoprene, once I cracked the neck seal I had all the negative buoyancy I could ever want. I drifted to the bottom at a comfortable rate, equalizing as I went.

There was one squeeze that came as a bit of a surprise. Not only did my mask want to embed itself in my face as usual, but if I didn't know better I would have said the suit had gone through two or three very hot dryer cycles between the boat and the bottom of the sea. It seemed to be shrinking rapidly. By the time I got to the wreck I felt like I had been set in hardening concrete, but did I put air into the suit to alleviate the situation? No! At least not right away. Once again, visions of rocketing to the surface like a pilot who's just pushed the eject button kept my reactions on the cautious side. I took a quick look around to get my bearings, waited for that first rush of sub-thermocline water to sneak down my neck, and then popped some air into the suit. No more squeeze, and no rush of cold water.

I took another look at the wreck. Ah yes, the inshore tug. But the last time I dove it, it was in New Jersey, where cold water always trickles down the back of your neck at least once. So far, so

warm.

I was at 80 feet; the water temperatures had been in the 50s on the bottom most of the summer and early fall. Deep divers ought to keep in mind the fact that as a neoprene drysuit compresses under pressure, it loses its insulating properties. It does offer more buoyancy should a suit flood, and at shallower depths, the suit itself affords warmth, thus requiring less bulky undergarments.

From that point on, if it hadn't been my objective to notice how the suit felt, I probably wouldn't have noticed it at all--any more than you "notice" wearing clothes. They're there, they keep you warm; if not, *then* you notice. After crawling around on the bottom for a while in a futile search for clawed crustaceans who wanted a hot butter bath, I squirted enough air into the suit to allow me to hover neutrally a few feet over the sand. Big deal. I can do that with a BC.

"Precisely," that little voice inside my head smirked. (I did wear a stabilizing jacket over the suit, but only used it on the surface swim back to the ladder.) My pressure gauge reminded me that diving with a drysuit is not *exactly* like diving with a BC. I had used a little more air than I usually do, but not enough to warrant twin 80s. Most of the drysuit divers I know do wear doubles, although I'm living proof that it's not necessary. When I wear a wetsuit, my air, attention span, bottom time, and

body temperature all seem to run low at about the same time; in the drysuit everything was on a different schedule. I was warm enough that I could have stayed forever. My pressure gauge didn't agree, and suggested we surface a few minutes earlier than usual. I learned early in my diving career never to argue with a submersible pressure gauge.

Besides, there was one difference between wet and dry suits that no one mentioned. If I didn't get back on the boat soon, I was going to be wearing a wet suit.

I guess the drysuit felt a stronger urge than I did—it was certainly in a bigger hurry to get to the surface. The exhaust valve on this particular suit is on the inside of the left elbow, which I thought made dumping air a little difficult. My pressure gauge was in my left hand at about eye level, and when I reached over with my right to press the button, the only reaction I got was a few drops of water. I ascended the last 15 or 20 feet much faster than I would have liked, quite perturbed and exhaling furiously. (On later dives I discovered I could remedy the problem by raising my left arm so the dump valve was about at eye level, allowing the air to rise to the valve.)

The swim back to the boat, aided and abetted by my trusty BC (inflated drysuits are reportedly tough to swim in—I'll take the rumor mongers' word for it), was uneventful. But it was one of those crazy fall New Jersey days when the water is still relatively warm, especially on the surface, but the offshore air is colder than a linoleum floor on a winter morning. On days like this I have gone to all lengths to stay in the water after a dive, because as cold as it might have been on the bottom, once that wind gets a hold of the moisture on your skin, any illusions of warmth will be shattered. "No, please, don't make me get out," I begged. "Just drag me behind the boat until we



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get to the next wreck." Once I even wore my wetsuit all the way back to the shelter and security of my own hot shower to avoid baring my tender skin to the breezes. "You'll be warmer if you take it off and get dry," a buddy suggested. Dry! If only I were dry.

I was.

I took off the nylon shell, dumping out the few tablespoons of water that had accumulated in the attached latex socks. Under the shell, the fleecy undergarment was dry (except for a little spot near the dump valve), and under the undergarment, I was dry. The only part of me that needed a towel was my face. The Caribbean it wasn't, but it sure was comfortable for October.

Interestingly, if I had stayed in the drysuit on board the boat, I might have been colder than my wetsuited buddies. Actually, in autumnal New Jersey it really didn't matter. A member of a rotating team of ice divers in Minnesota, on the other hand, could stand to lose a lot of precious body heat.

There are other considerations. I've always believed that if it's cold and nasty enough for a drysuit, I probably don't want to be diving. That same cold wind that makes taking a wetsuit off so miserable does wonderful things with wave heights. If you get queasy easily, the warmest drysuit in the world won't help. But that's why God

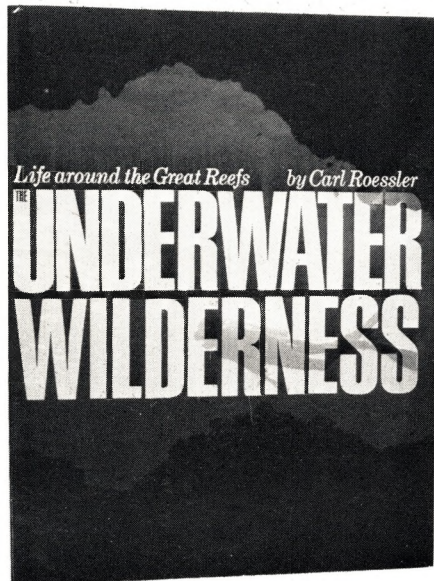
invented Dramamine and Triptone and those patches behind your ears.

Nitrogen intake is another. Although its application to sport diving at this point is tenuous, research with commercial divers seems to indicate that cold divers have a lesser incidence of the bends. His metabolism slowed, a cold diver absorbs gas more slowly—but gives it off more slowly as well. The optimum situation, for decompression diving anyway, seems to be cold during the working part of the dive and warmth during decompression (assuming bubbles haven't formed already). More research on the matter is planned; in the meantime, Divers Alert Network Assistant Director Chris Wachholz reminds me, a cold diver is more likely to run into problems with hypothermia and dehydration. Because a cold diver's blood is more concentrated, he is more prone to decompression problems.

Drysuits do take a little getting used to, preferably in a controlled environment. But if cold cuts your dive season short, or restricts your diving to expensive, few and far between destinations once a year or less, you could probably get used to one real fast. ■

Divers' Lines

The Underwater Wilderness: Life Around the Great Reefs by Carl Roessler



Some books teach, others entertain. Carl Roessler's *The Underwater Wilderness: Life Around the Great Reefs* does both in one beautiful volume. This 361-page introduction to the world of the coral reef is packed with rich color plates as well as explanations of the natural phenomena that make coral reefs and their surrounding communities so special.

The book is divided into two sections. The first, *The Society of the Underwater Wilderness*, discusses coral reef formation, the reef community, and behaviors such as cooperation and aggression, symbiosis, and protective coloration and how it works. The text is technical enough not to bore those already somewhat familiar with the subject, yet clear and direct enough to serve as a good introduction.

The photographs speak for themselves. Kaleidoscopic colors leap from every page. There are all manners of strange creatures and constructions, some familiar, others unusual, even grotesque. Sometimes it takes staring at a picture of one, rather than seeing it for a fleeting moment in real life, to realize how bizarre looking some of these animals and fish really are. Most of the photographs are close-ups, and the details are incredible. Cap-

tions tell what each specimen is, where the picture was taken, and the scientific name (when the animal has been classified. Many of those in the book haven't). Although I wouldn't have wanted to mar the beautiful color plates with type, at times I did find flipping back and forth from the photos to the caption page annoying.

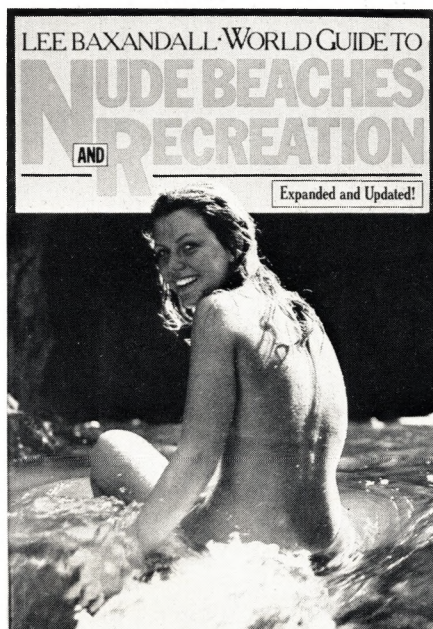
The book's second half is dedicated to a grand tour of the *The World's Greatest Underwater Wilderness Areas*. Through words and more marvelous pictures, Roessler takes his readers to the Caribbean, Hawaii and the Galapagos, the South Pacific, Australia's Great Barrier Reef and Coral Sea, the Red Sea, and the Mediterranean.

In his introduction, Roessler says "The hope is that this illustrated record will arouse such an interest in the underwater wilderness that the reader will join those who are trying to defend it."

The large volume would make the perfect addition to a diver's library or coffee table, and would be a great way for divers to introduce non-diving friends to the importance of preserving the underwater wilderness.

The Underwater Wilderness is available from Chanticleer Press, New York. ♪

World Guide to Nude Beaches and Recreation by Lee Baxandall



This expanded and updated version of the *World Guide to Nude Beaches and Recreation*, first published in 1980, contains all the latest listings of clothes-optional recreation sites in the United States and elsewhere.

Seven chapters cover the United States, Canada, Central and South America, the Caribbean, Europe, Africa and the Middle East, and the Far East and South Pacific. Subsections within each chapter offer listings, mostly based on reports by readers, broken down by state or country or, in the case of California, by county. Blurbs at the beginning of some subsections tell the official status of clothes-optional recreation (The Chinese strongly discourage it), while descriptions are given of possible sites, as are directions to them. Clubs and contacts in each area are also provided.

There are also helpful notes for those not yet initiated into the world of "naturism," such as notes on protecting skin from the sun, the history of social nudity, and--importantly--naturist etiquette. The book is interesting reading, and full of information. U.S. federal law does not prohibit nudity, which makes Alaska-96 percent federally owned--a great haven for naturists. The book was the subject covered, from the famous Black's Beach in San Diego to the best quarries outside of Bloomington, Indiana, to those secluded little beaches in the tropics. It even mentions the two beaches in Denmark where bathing suits are required.

The guide is illustrated with tasteful black and white and color photographs, giving credence to the innocence of nude recreation. Nude, the book reminds, is not necessarily lewd.

Updated information is available each year in the May issue of *The Naturists'* magazine, *Clothed With the Sun*.

The 122-page paperback is available for \$14.95 from Free Beaches, P.O. Box 132-D, Oshkosh, WI, 54902. ♪

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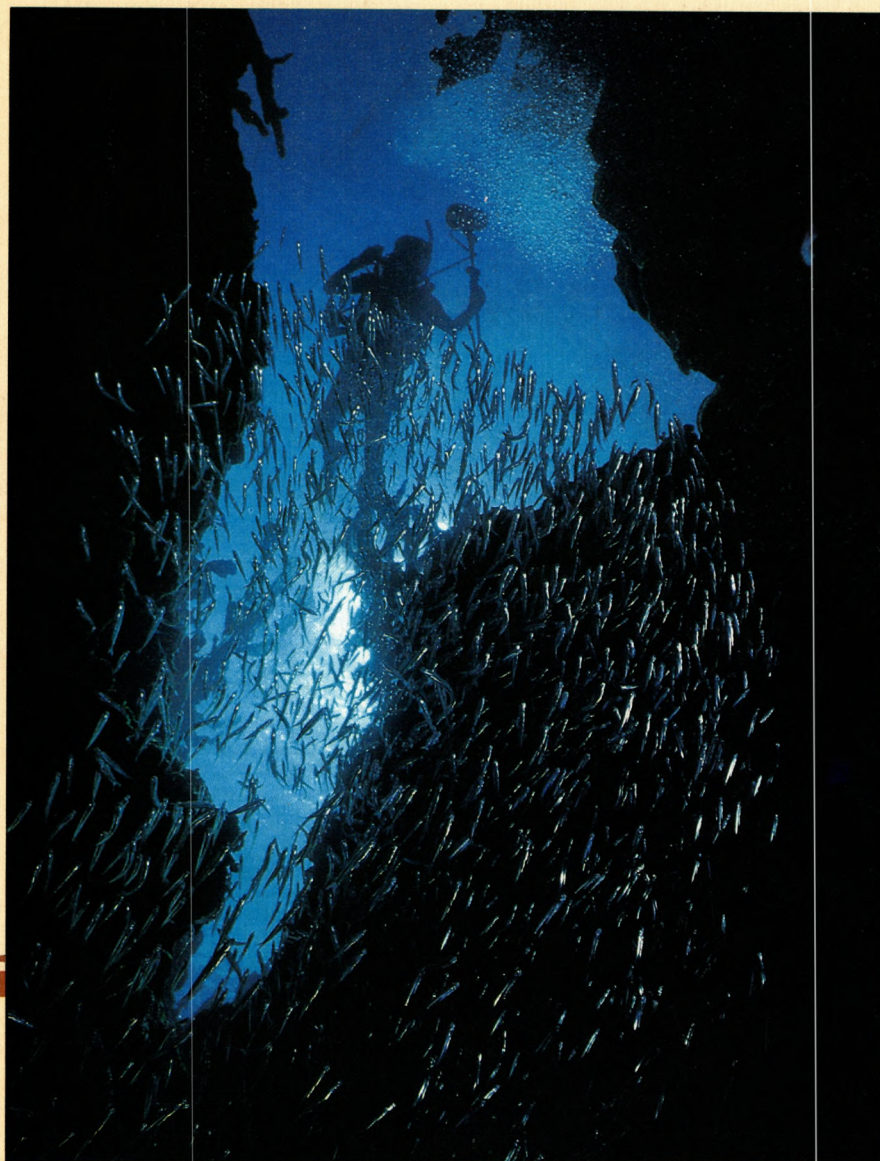


Photo: Robert Holland

East End

The other side of Grand Cayman

Article by Robert Holland

As the DC-9 began descent its wing dipped and we gently banked to the left, affording us a complete view of Grand Cayman. It sat in isolated radiance, alone in the sea. From a few thousand feet North Sound appeared as a well-sculptured bite taken out of the island. Just to the west lay famous West End with its populated towns and hotel dotted shoreline. On the north and south coasts there were fewer dots along the beach and a maze of mangrove-studded landscape. Far

to the east appeared as little more than a sparsely populated village. As the big plane circled again for its final approach, East End's beauty came into full view. Its variety of limestone-riddled shore and sand beach argued their way from Halfmoon Bay to Great Bluff. Waves tumbled over the protecting fringing reef which created a tranquil lagoon all along the East End. A smattering of villages with clean tiled roofs gave just a hint of civilization to those of us who had departed

somewhat less tranquil shores.

The phrase 'just a hint of civilization' could easily hang right below the sign which welcomes you to Grand Cayman's East End. It is a mere 40-minute ride from the capitol of George Town depending, I should add, upon the mood of your driver -- but it could easily be a different island. While the West End and Seven Mile Beach court multitudes of tourists and divers, East End has only two resorts nestled here among the villages

and palms. There is virtually no crime and her doors are not locked; in fact, guests are only given room keys if they insist upon it. The cordial atmosphere of the island and its people is apparent since your main contact is primarily with residents rather than tourists. Perhaps only ten percent of Grand Cayman's population lives in the Eastern District and most of them commute to work or sustain themselves from the sea. Their temperament is much like that of the divers East End attracts—easy going and maybe a bit reluctant to see too much civilization.

While the Caymanians are warm and very friendly, it's the superb and largely unexplored diving that attracts divers to the East End. Being relatively isolated has its advantages. You will not find broken coral, heavily dived areas, or even other divers to share the reef. There are just two resorts located here, as compared to seventeen on the opposite end of the island. Each caters to those with an 'escapist' attitude and a love for serious diving.

Accommodations are not fancy but rather functional. You will find air conditioning and clean rooms but no TV or night clubs. The ambience is borrowed from the surrounding villages and scenery. The hotel and local restaurants feature excellent seafood and even noteworthy steaks. At the northeast corner is the Tortuga Club, which caters to both divers and fishermen and has a multitude of activities to offer in addition to diving, including sailing, waterskiing, tennis and shuffleboard. This multi-acre club is located on a gorgeous beachfront. A couple of miles south lies the Cayman Diving Lodge, which is well known as the hot spot for serious divers. At 'the lodge' (as it is affectionately known), divers enjoy a casual atmosphere at the small hotel and eat buffet style under an open-air, thatched-roof dining area. The hotel bar is a local haunt for some of East End's residents and an excellent place to learn just



Photo: Greg Johnston

Previous Page: Divers and baitfish among the caverns of a shallow reef off the East End. Above: There are many impressive shallow coral heads along the north Coast of Cayman Brac.

about anything you want to concerning the island, its people, and diving. If only one word were allowed to describe the lodge it would have to be 'friendly.' The staff is there for the solitary purpose of pleasing guests. Both operators have full service dive shops and V-hulled boats rather than West End's traditional flat-top boats. Additionally, Cayman Diving Lodge has an impressive array of photo equipment for rent or classroom use which includes video, 16mm, and still picture cameras.

If you are interested in strictly underwater terrain and want to spend most of your time there, you have an additional way to see this part of Grand Cayman. The floating dive resort CAYMAN DIVER has been servicing Cayman for ten years and is an excellent way to see the East End's remote reefs. This first rate motor vessel is booked through See & Sea Travel and can place you right on top of reefs which Seven Mile Beach divers never get the chance to see.

If the idea of diving untouched reefs and peeking over walls that few others have appeals to

you, the East End is most certainly your cup of tea. These waters are, without a doubt, enough to inspire the most seasoned diver. Underwater visibility is considered 'poor' if less than 100 feet. Since there are no freshwater rivers or extensive rainy seasons, visibility can only be reduced by bad weather. The solution is to dive the leeward side of East End, which varies according to wind direction. Northeasterlies cause rough water on Grand Cayman's east side, moving the calmest diving around to the south toward Bodden Town. Arctic north-westers, on the other hand, lay East End waters down while raising havoc along Seven Mile Beach.

No matter which side of the island you dive, the ever-present wall which lifts the island from the sea is an awesome sight to behold. Its coral-garnished rim begins in depths ranging from 45 to 80 feet and plummets downward in beckoning slopes that reach 6,000 feet. Large, wide sand chutes channel sand and debris from the shallow reefs to the wall where they cascade over the edge like slow-motion waterfalls. The top of the wall is riddled with tunnels, caves, and arches. Many of the shallower spur and groove reefs share the same geologic formations and allow a longer bottom time.



Left: Exploring the sponge padded tunnels of East End's reefs could take a lifetime.

Photo: Robert Holland

One of these fantastic reefs is Ironshore Gardens, on the south side of the island. The coral ridges of this spur and groove formation have a 40-foot relief and appear as miniature models of the continental wall which exists in the deeper water. Ironshore has tunnels which lead into the limestones structure of the reef and split into three or more separate passageways. The tunnels are wide enough for several divers at a time and are usually shared with synchronous schools of baitfish. If you patiently wait nearby you can witness the school being attacked by grouper of all sizes. Not far from Ironshore Gardens is the River of Sand, a sand chute which begins in 50 feet of water and plummets over the wall at a depth of nearly 100 feet. This sloping stream of sand is undercut along its sides much like the eroded shoreline of a river, creating huge chambers and tunnels which eventually spill over the nearby wall.

Moving northerly along the wall is a particularly colorful sight as alternating channels of reflective white sand and darker coral spurs alternate beneath the boat. Along shore the scenery is a beautifully monotonous combination of palm-studded beach and limestone-carved cliffs, with a few waterfront cottages thrown in for variety. As you climb the east

coast from the Blow Holes toward Colliers Cay, a magnificent section of the wall known as The Maze must be visited. Here, interconnecting limestone tunnels forge their way in and out of the reef, creating numerous passageways for fish and divers alike. The slope of the wall here is as vertical as scuba-equipped divers will ever see.

Near the northeastern corner of Grand Cayman an unusual silhouette appears on the horizon. The fully exposed wreck of the RIDGEFIELD, an old liberty ship grounded during the Bay of Pigs invasion, sits oddly out of place atop the fragile fringing reef. It's hard to imagine any such conflict here.

Around the less-protected northeast corner of the island a myriad of dive sites await. Black Rock, with its beautifully rare stand of pillar coral, and Grouper Hole are two of the best shallow reefs. At one point on Grouper Hole a chimney 20 feet across plummets deep into the reef and branches into a pair of long and beckoning tunnels which seem to call to you from the edge of the nearby wall. I watched from afar as my dive partner glided beneath the chimney, showered by rays of sunlight and warmth, and could think of nothing but the beauty before me and the deep blue abyss which tugged at my

shoulder from behind.

Such thoughts are the rule rather than the exception on this end of Cayman. The prolific limestone structures adorned with live coral and sponge will fill your thoughts long after you've left the blue. If it's more you seek, you need only look closer. The shallow reefs bear pinnacles of elkhorn which rises nearly to the surface in some places and are populated with grouper and squid, as well as tropicals of numerous kind. The deep slopes and walls wear sponge of impressive color and size, while the soft corals fight valiantly for space with horizontally-spreading plate coral. And the big creatures are here, too: Tarpon, manta, shark, and barracuda are not uncommon sights.

With all its isolation and tranquility, East End might leave you just a touch curious about what antics go on in the more 'civilized' West End area. Worry no further. Rental vans and cars are surprisingly affordable and taxies are abundant-though somewhat less cost efficient. If you're really adventuresome, take advantage of East End's unwritten rule about hitch-hiking. Since not everyone has a car, islanders and tourists alike are expected to lend a ride if they have the room. My own indoctrination to Cayman hitch-hiking reminded me of a film from a driving school class-a bit hairy, but we did make the normally 40-minute trip in a mere 20 minutes!

You set the pace while staying at East End. You can choose to dive to your heart's content or lay on the sand counting stars in the sky. East End has kept civilization out. The rest is up to you. ■



Photo: Harold Quidley

The Caymans

Article by Donna Potter Quidley

Like Alices exploring Wonderland, the thousands of divers who visit the Cayman Islands each year have made these enchanted isles a major hub of the scuba resort business--in fact, one of the world's top four diving destinations. Cayman's tranquil aquamarine waters, dramatic drop offs, and changing cast of underwater creatures may well provide nature's finest submarine showcase.

In most spots, walls begin only 200 to 300 yards from shore. Fringing reefs encircle much of the islands' coastlines. The trio--Grand Cayman, Cayman Brac, and Little Cayman--are the flat-topped tips of the Sierra Maestra, a huge, submarine limestone mountain range barely protruding from the indigo waters known as the Cayman Trench. Together the three

islands comprise an area of about 100 square miles in the tranquil Caribbean Sea, 480 miles southwest of Miami. The water temperature averages 83 degrees, and the tropical beaches are constantly brushed by gentle trade winds, making relaxing above and below the water a treat. The waters on the leeward sides of the coastlines are calm almost every day of the year. The variety of diving--drop-offs, medium and shallow fringing and patch reefs, wrecks, and beach entries--assures both safe and memorable diving experiences for everyone from the newly certified to the advanced diver. Night diving here fulfills my favorite underwater fantasy, complete with all the creatures of the twilight zone.

As if sparkling waters and sandy beaches were not enough to

lure tourists to these islands again and again, both the history and the charming inhabitants of the Caymans will make return irresistible.

The name "Cayman" was derived from the Carib Indian term for marine crocodiles, *caymanas*, which were known to inhabit Little Cayman in the 16th century. Early explorers mistakenly thought the term referred to the abundant iguanas found on the three islands. Christopher Columbus named the islands *Las Tortugas* (Turtle Islands) in 1503, after landing there during turtle egg-laying season. However, the Spanish did not colonize the islands, but instead used them as a convenient stopping place for their ships. The first British settlers, former soldiers from Cromwell's army in Jamaica, arrived more than a century later.

Three Islands where time's out of mind

As a result, the Caymans eventually became a British colony and remain under British rule today.

Each of the three islands offers a unique and alluring variety of accommodations and activities. Whether you want exciting night life, a secluded hideaway, or both, the Caymans have it all.

GRAND CAYMAN

Heavenly Resorts Not Far From Hell

Air service from the United States will bring you to Grand Cayman, the largest and most developed isle of the trio. Approximately 22 miles long and 4 to 7 miles wide, the island offers more than 25 miles of undersea frontier. Accommodations range from hotels to apartments and luxury condominiums. Dive resorts are located in areas ranging from secluded hideaways to the well-known Seven Mile Beach on the island's west end. At Seven Mile Beach you will find gorgeous sunsets and consistently calm seas, as well as the majority of the island's hotels and condominiums.

Whether you want exciting night life, a secluded hideaway--or both--the Caymans have it all.

As for dive resorts, the array includes Beach Club Colony, Galleon Beach, Holiday Inn, Coral Caymanian, and the newly remodeled Royal Palms. Spanish Cove, another resort, is just around the northern tip of Seven Mile Beach. The proximity of these resorts to Georgetown, the capital of the Caymans, provides the vacationer with shopping, dining, and entertainment alternatives. At the nearby West Bay district, near the town of Hell, travelers may also admire the world's only successful commercial green sea turtle farm.

Nineteen different dive operations range from small to

larger volume facilities. The floating resort *M/V Cayman Diver* offers weekly live-aboard dive cruises. Underwater photography has become a booming business in Grand Cayman as well. Underwater camera equipment rentals, repairs, photo courses, and fast E-6 processing services are available at some facilities. Fisheye Photographic of Grand Cayman, owned by Martin Sutton and Ahuva Zaid, offers special photo-dives aboard their flat-top boat, the *F-Stop*.

After a short boat ride, divers are ready to drop into another world where the visibility averages 100 to 200 feet. There may be more species of sponges concentrated around the Caymans than at any other diving destination. Rope, barrel, azure vase, and tube varieties decorate the steep walls. Over the edge of the precipice the water changes from aqua to the inky indigo of the abyss. Exciting grottos, caves, and passageways teem with marine creatures.

Sites such as Orange Canyon, Big Tunnel, Trinity Caves, Sentinel Rock, Sand Chute, and Big Dipper have become household words to serious underwater photographers

and divers. Huge barrel sponges, massive enough to hold two divers, and graceful red gorgonian fans combine to provide an exquisite panorama of wide-angle photographic subjects. One medium-depth site, appropriately named Aquarium Reef, is filled with curious but tame fish. Divemasters and guests hand feed the angel fish and other reef fish daily. The corals are healthy, as they have grown undisturbed for thousands of years. Nearby Peter's Reef is an equally leisurely dive.

Besides the excellent natural reefs, two shipwrecks are sure to provide unrivaled photo subjects off Seven Mile Beach. One wreck my husband, Harold, and I looked forward to diving during the day and at night was the *Oro Verde*. In 1979 this Panamanian cargo vessel was deliberately run aground in the North Sound by her angered and unpaid crew. She rested there until

Left: Donna Quidley shines light on tube sponges. Below: A moray eel emerges for a bite to eat.



Photo: Jesse Cancelmo

1980, when Bob Soto purchased her and towed her to her present site. The 180-foot vessel lies intact in about 50 feet of water at a 45-degree angle, and is fully visible from the edge of a beautiful nearby patch reef. In the years to come, as more corals and sponges attach and grow, the wreck can only become more beautiful. Even now, the *Oro Verde* is certainly a shipwreck photographer's dream. One night when we visited the wreck we found an octopus outstretched, its tentacles spread radially. Tiny red-banded coral shrimp seemed to be everywhere inside the structure, as were a school of tiny silver bait fish.

Another spot for night dives is the remains of the 375-foot trader, the *Balboa*. A hurricane in 1932 laid her to rest in 30 feet of water in Georgetown Harbor. She was later dynamited to maintain safe passage for other ships. At this site we enjoyed close-up encounters with spotlight parrot fish, trumpet fish, blue tangs, and a large coral crab. Inshore from the *Balboa* is a 200-foot freighter, the *Cali*, which lies against the shore in 8 to 25 feet of water. This is a boat or beach dive.

Although many people prefer a developed area such as Seven Mile Beach, the sister islands, Cayman Brac and Little Cayman, offer the mystique of remote tropical getaways. To know the Caymans intimately, plan to sample this pair of islands which seem to be suspended in time.

CAYMAN BRAC

The Promise of Pirate Treasure

Cayman Airways serves Cayman Brac twice weekly, with an 89-mile northeast flight from Grand Cayman. This 12- by 1-mile island comes into view through puffy white clouds set against blue-green waters. *Brac* means "bluff" in Gaelic, and the source of name becomes readily apparent as we admire the picturesque 140-foot cliff that rises to a peak on the eastern tip of the island. The limestone bluff is hollowed with catacombs where some islanders say pirate's treasure remains undiscovered.

The Brackers are descendants of marooned Scottish pirates, Welsh shipwreck survivors, West Indians, English, and Irish. Their accents reflect this blend made rich by the West Indian *patois*. The present population is less than 1,700, and the island's remoteness has spiced residents with an old-fashioned manner and community spirit. Crime is virtually nonexistent--the Buccaneer Inn has not issued room keys to guests for the past 25 years. The Buccaneer Inn is a 32-room, clean, quaint seaside dive resort situated on the ironshore beach of the northern coast. Tanks are placed on the sandy stretch near the shore each night, as shore dives here are lovely. Visitors to Cayman Brac are typically there for one reason, and one reason only--to surround themselves with that relaxing, clear water. A rustic thatched-roof bar beside the water is a perfect place to meet some of the local residents

Below: Octopus

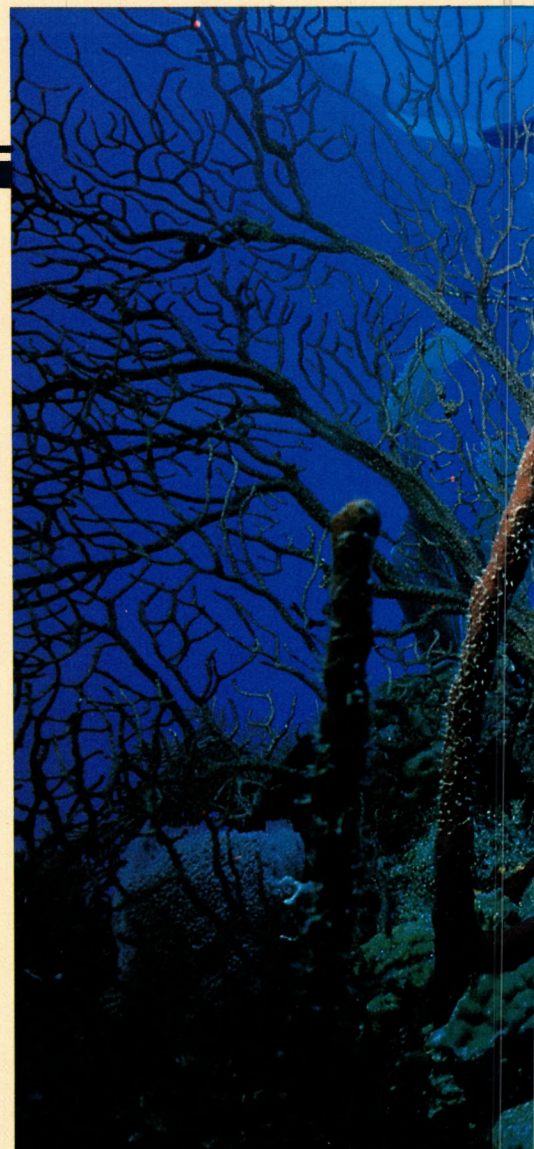
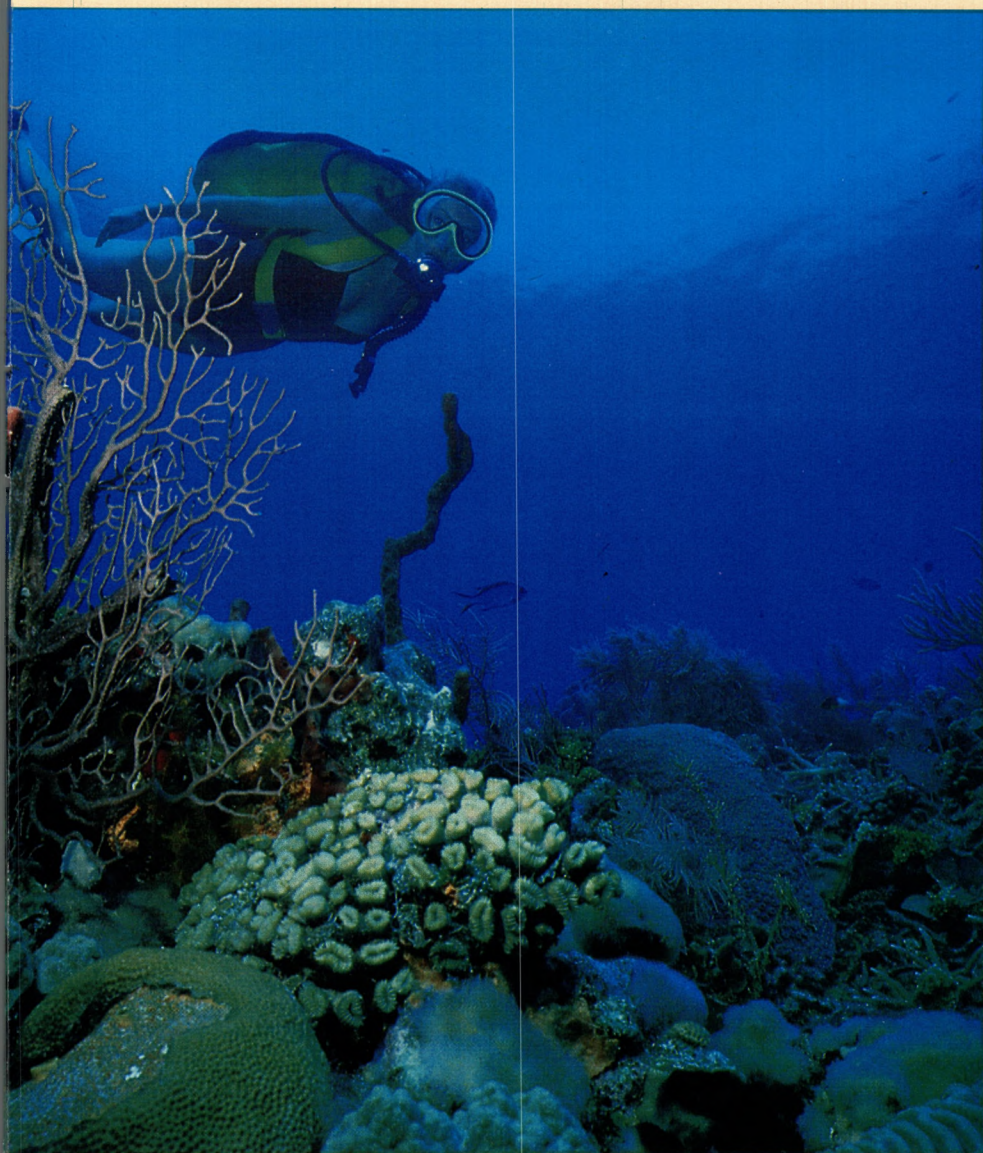


Photo: Harold Quinley



Left: Flower Coral cluster.

or to hear a local band perform favorites such as "Yellow Bird." If you prefer air conditioning and a more modern-looking resort, plan to vacation at the Brac Reef, a 29-room resort on the south shore. Although beach diving for this resort is done in front of the Buccaneer, arrangements are easily made, as Winston McDermott's Brac Aquatics serves both resorts. Nightly calypso bands and a bar that juts out over the ocean are conducive to livelier night life. Winston will also arrange a half-day hike up to the bluff and into the caves, if your group prefers to give up one afternoon dive.

Uncrowded diving is assured. Wall dives such as Buccaneer Chute, Cemetery Wall, Anchor Canyon, and the Hobbit are thrilling. A huge, 100-year-old anchor spreads across a deep coral canyon, cemented in place over time by the corals. Past the anchor, the canyon continues toward a

steep right-angle drop-off. Orange tube sponges galore wait to be photographed. In addition to the beautiful sponges, we found delicate orange crinoids with tentacles extending toward Harold's camera.

The Hobbit wall is located on the south shore, as is the Anchor Canyon. The strangely shaped sponge growth must have given the Hobbit its name, and we were captivated by the unreal quality of this seascape. Boat dives from 25 to 50 feet deep were serene at such locations as Windsock, Duppy's and Elkhorn Forest reefs. These reefs boast combinations of lofty pillar corals, elkhorn branches, and maze-like staghorn corals. Large purple sea fans sway in the gentle currents. Hungry spotted flamingo tongues can be found grazing on these soft corals, busily stripping the fans' living tissue from bits of the animals' skeletons. Macro or wide-angle photography will keep

the shutterbug well occupied throughout these dives.

Occasionally a large green moray will come out from his hiding place to pay the excited divers a visit, then retire into another crevice. Tropical reef fish cluster around the coral branches and glide through each crevice.

Both Buccaneer and Radar Reef are excellent shore dives, especially at night. Harold and I photographed colorful orange ball anemones, tiny red hermit crabs, lavender tube worms, and a shy octopus. One time Harold nudged an octopus to a more photogenic site with the handle of his dive knife. The octopus surprised us by reaching out and taking the knife from his hand. The creature eventually put it down and Harold proceeded to photograph. With each strobe flash, the octopus changes color. What began as a light turquoise-blue changed, chameleon-like, to a blood red with white dots.

Weather permitting, Winston schedules once-a-week trips to neighboring Little Cayman, seven miles across the channel. Once a diver or photographer has had a taste of Little Cayman's wall diving, he or she will be sure to plan a return trip.

LITTLE CAYMAN Blackbeard and Bloody Bay

An 18-seat Trilander brings guests directly to this 9- by 1-mile island. Some have called Little Cayman the "crown jewel of the trio." To me, the underwater sites here are the things of which dreams are made and memories kept. If 200-foot visibility is not enough, try to imagine sheer vertical drop-offs as little as 18 feet below the surface. Only one haven, Pirate's Point duplexes, caters especially to divers, and there are only seven rooms at present. However, I imagine that Danny Hughes, who runs the place, is not complaining. Little Cayman is still

Continued on Page 50





Life Among the Sharks

Article and Photography R. Ingo Reipl

The divers passed by day after day as I watched them from my impromptu camp at Ras Muhammad. I had been living there five months already, out of a van I drove to this point at the bottom of the Sinai Peninsula from Germany in April 1979. I had rushed to this place, renowned to divers everywhere, because Camp David discussions promised an imminent return of this paradise from Israel to Egypt, possibly placing it out of bounds to tourists altogether. What I first thought would be no more than four weeks of diving stretched into eight months. I was unable to slack my thirst for exploring the incredible variety of coral life in that place; only politics could force me to leave.

Arriving at much the same time as myself and my partner were huge schools of snapper, with Bedouin fishermen not far behind them, hooks a-ready. The Bedouin only fished at night. Every morning a truck filled with ice arrived to take their catch to market. They kept some fish to dry during the day for their own use, and slept until night fell again. Other than these fishermen, Ras Muhammad is a lonely place. Except for the beauty of the sea, the spot offers no visual solace, no fresh water, and only a single cluster of mangroves to lend variety to the monotonous formations of fossilized coral that make up the mountains to the sea.

At night, the place was especially quiet, as it was a military area. We had to drive three

kilometers northward from our diving spot every night to our camp behind the military border. Our friends Avi Nabek and his wife, Harriet, had built a coffee shop there from palm fronds, like an old western outpost. They were the representatives from the Israeli Society for the Protection of Nature in the area, a government organization dedicated to guarding the wildlife. At night we sometimes snuck back to the reef for night dives, and only the sharks were the wiser.

Ras Muhammad has always attracted sharks because of the swift currents generated by the open sea so close to the reef's sharply descending vertical drop of more than a thousand feet. Sharks need water passing over their gills in order to breathe. They find being moved about by currents infinitely more relaxing than having to swash their tail fins back and forth, in the case of gray reef sharks, or their whole bodies, as with hammerheads, to propel themselves. Although the books would have it that their motion must be constant, I witnessed more than once gray reef sharks sleeping on the sandy ground in shallow water of about 15 feet. I shook them by the tail to awaken them, thinking them ill, only to discover they were just taking a nap.

Whatever the heart of a diver could desire to encounter could be had in this paradise. Fantastically large creatures crash up against the reef from the open sea, taken by surprise by the vertical shelf in



Above: Mingling with the sharks is a daily affair. Previous Page: Jessica Roessler examines the flora in the Red Sea. (Photo by Carl Roessler)

the Hidden Bay. There were huge schools of butterfly fish, enormous barracudas up to six feet long, and not dangerous like their Caribbean cousins; 15-foot mantas that with wings outspread could be taken for small submarines; green parrot fish in schools of thousands, powerful jack fish darting rapidly through the area, sea turtles aplenty to be seen every day, more than thirty clown fish to be found in a single enormous anemone, a phenomenon rare even in the Gulf of Aqaba. We saw two-foot unicorn fish in the hundreds, black corals with trunks thicker than a man's arm, Napoleon fish the size of large motorcycles, so powerful they chew murex shells like peanuts. At the entrance to the reef, guarding her cave, lurked the six-foot Emily, a dark-brown moray

Divers feed residents of Ras Muhammand

two white-tip high sea sharks, more than seven feet long each, plunged forward out of nowhere. Each one caught a fish head and then disappeared, but managed to empty the area of life in just seconds. Shortly thereafter, three curious hammerhead sharks sauntered up, only to find all the food gone, so they left, too. As we found later to be their habit, they passed once again in the distance, but never close enough to be photographed. As for the white tips, their speed

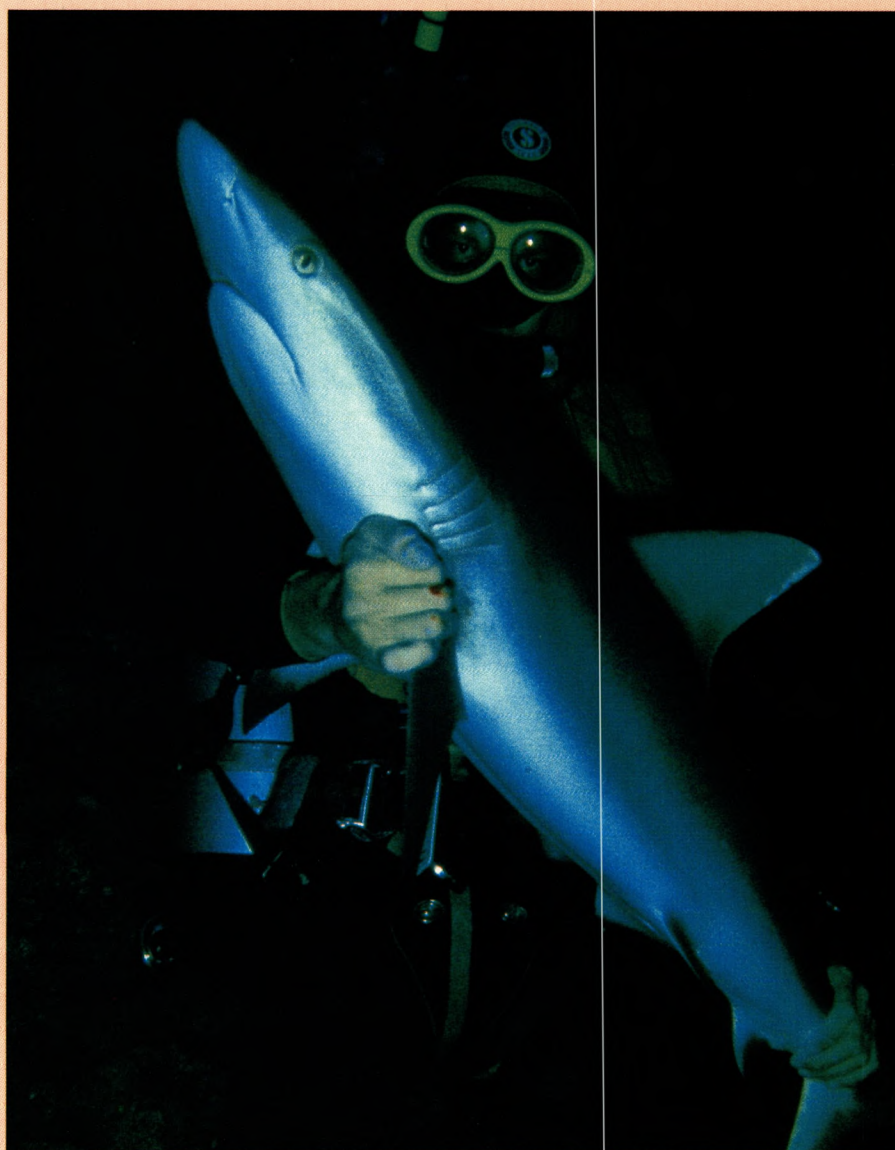
prevented me from photographing them. Before I even brought my hands down to my camera, they were gone, not allowing a moment even to be frightened. I was to find this behavior typical as I tried more and more to photograph these shy animals.

Although this method of shark feeding had been unintentional, I used it later on the reef to encourage slow-moving gray reef sharks to come to me to be photographed. In the open water, the fast motion of the white tips made the situation too dangerous for feeding, so we settled for just diving. We saw hammerhead sharks every day until the end of

Below: Shark and diver greet with caution.

eel who enjoyed a flirtatious tickling under her chin. Whenever we passed she got her share of the fish we brought down to feed the sharks.

Klaus was responsible for introducing us to open-water diving, where we discovered shark feeding by chance. He was a German river skipper, a beardless Hemingway type, who came to Ras Muhammad with his wife and a rubber boat for a six-week vacation. One day he invited us out to accompany him to the open water, about 150 feet out from the reef. In order to photograph large fish, he was going to entice them by means of fish heads and insides acquired from the Bedouin fishermen. Saved from the long snorkel, we joyfully descended to about 50 feet, where we balanced ourselves and then emptied the bloody contents of the plastic bags into the water. Immediately hundreds of surgeon fish, groupers, and goldfish were fighting for the floating delicacies, to our amusement. To our shock,





Above: Seven house sharks patrol the reefs of Ras Muhammad.

September. The gray reef sharks were not so easy to convince to relax in front of the camera. We tried placing a fish head the Bedouins gave us on a promontory and hid at a distance on the reef, but they weren't fooled. They simply circled around and around, teasing us with their introversion. When we departed, one of them snatched the fish and the others chased him into the blue.

There were seven house sharks in all, always found patrolling the reefs of Ras Muhammad. We got to know them by their markings. Their leader we named Schmulik. He was the one who had grabbed the fish head. He was always first and far more aggressive than the others. He had a hook stuck in the right side of his mouth and was five feet long and lean. Morris was short and fat. A third shark had a small hook with a leftover piece of rope dangling from the right side of his mouth. Another had two big scratches after its back fin, probably a female bit in loveplay. A fifth had scratches on its tail. The sixth had some spots on the underside of its body. The seventh had a small piece cut out of the back fin.

In the following days we continued to leave fish heads on the reef. The sharks, especially Schmulik, helped themselves. They would always dash away after grabbing the fish, so I decided to attach it to the reef with a rope. The sharks then had a struggle to disengage it and wrestled among themselves for the bait. In their concentration they became more courageous and indifferent to us as we sidled closer to them. When the currents were quite strong they were much more aggressive and needed only five minutes to carry off their prize. But in times of little current, they might dawdle for more than an hour before the bait was attacked. In the strongest of currents and with ample bait, more than twenty sharks could be attracted at one time to one spot. Occasionally makos, white-tips, and hammerheads would pop up out of the blue, investigate the proceedings for a moment, then disappear as quickly as they came, never attempting to take our offerings.

Once a hammerhead approached me against the current as I drifted with it. At a distance of 30 feet I thought to take his portrait until I noticed through the viewfinder that his mouth was opening and closing and his body was shaking in a very threatening manner. Instinctively I knew I

shouldn't go closer. I let the air out from my life-vest and shot down into the deep, out of his path.

After two months, when the sharks were used to us, I told my partner that I would like to photograph him feeding the sharks from his hand. He agreed to try it and waved a fish at the sharks while holding on to the reef in the strong current. Despite the difficulty of maintaining my position in this terrific current, using the camera only with one hand while I held on to the reef with the other, I got the shot of the first shark, Schmulik of course, snatching the fish out of my buddy's hand. From this day on, they were only fed by hand, whenever possible, which was only in strong current. In the low current, nothing could interest the sharks in the fish even when we dropped them.

One night by the campfire, I fantasized about photographing the eye of a shark. I mentioned to my partner that we could catch Schmulik and I could also remove his hook. We devised a way to hook him with a shackle, and then hang on him with a rope. The next day found Schmulik in captivity in my buddy's arms while I furiously snapped the shutter. It worked, much to our surprise. In his initial wild flapping about he broke the focusing attachment to my close-up tube and scratched my partner's ungloved hands with his sandpaper-like skin. But I managed to take five or six frames after he calmed down a bit. One of those shots even won me Picture of the Month in a German diving magazine, *Submarin*. After five minutes Schmulik was pacified enough for me to open his jaws and reach inside his mouth with six-inch pliers to remove the two hooks from his lips. The old hook left just rust marks on the edge of his mouth, and our hook a small wound. We let him loose by thrusting him forward. Once he discovered he was no longer bound, he whisked himself away. The next day his fear of us had worn off and he flaunted his brazenness as before.

In nearby Sharm-el-Sheik, divers had heard of the "two crazy

Germans" and our ventures, and visited us to accompany us on our feeding expeditions. They brought their own fish, so there was plenty to go around. But if the current was nil, so were the sights. After a while, I became satiated by the procedures and the crowds, and discovered the joys of taking macro pictures along the reefs.

In September, a huge flood clouded the visibility in the sea for a while, pushing me even more in the direction of macro photography. A ten-mile stretch of road was totally destroyed by the water rolling down from the mountains in huge wadis, which made their way to the sea like rivers and took all in their path with them. The damage in Sharm-el-Sheik was incredible--three human lives were lost, the buildings were flooded up to their second floors, huge piles of mud lines the roads. The road to Ras Muhammad was closed for five days while the Israeli army cleaned the area of mines loosened in the flood.

My partner was homesick for Germany and pressed me to return, but I coaxed him to stay until the Egyptians regained rule over the area on November 26, 1979. For four months in Germany I prepared my own van to make a more permanent and independent move to Sinai. I began conducting diving tours in order to maintain myself in the desert. I had discovered the other favorite locations on the Red Sea--near the oasis Dahab, the Blue Hole, the Canyon, the Lighthouse, the Garden of Eels, and the South Oasis near the Wadi Gne; further south Ras-et-Tantur, Ras Nasrani, and near Sharm-el-Sheik, the Amphores, the Paradise Reef, the Fiasco Reef, Ras Umm-Sidd, also called Shark Point, and the reefs in the Straits of Tiran. I found life in the desert exactly to my liking.

When the Israelis gave back the rest of the peninsula on April 25, 1982, everyone was evacuated. Now the area is again open for diving and beckons the would-be adventurer to sample the fabulous coral reefs. I, for one, plan to return as soon as possible to the magic of Ras Muhammad. ■

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Saving the Red Sea

Article by Cathie Cush
Photography by R. Ingo Reipl

God looks down at Moses, who is standing on the brink of the Red Sea. The Pharaoh's men are in hot pursuit.

"Moses," God says, "I have some good news and some bad news."

"What's the good news?" Moses asks, one eye on the approaching Egyptians.

"I will part the Red Sea and you and the Israelites can cross in safety. When the Pharaoh's men try to cross, I will rejoin the sea and smite them down with a wall of water."

"Thank you, Lord," Moses replies. "So what's the bad news?"

"First you have to write the environmental impact statement."

The anecdote may elicit a chuckle from those familiar with the bureaucratic entanglements involved in environmental protection anywhere. But conservation in the Red Sea is no laughing matter, and no one takes the preservation of that vital area's resources more seriously than Dr. Eugenie Clark, world renowned biologist, diver, author, and professor of zoology at the University of Maryland. Clark, who

once wrote in National Geographic that the Red Sea "is perhaps the most extraordinary large body of water on earth," has been exploring the undersea treasures of the Middle East for thirty-some years. Recently this remarkable woman (who speaks of environmental causes and hot fudge sundaes with equal enthusiasm, and who looks to be twenty-five years younger than she is--61) has directed her seemingly boundless energies toward conservation of the Red Sea.

In July 1983 the Egyptian Parliament designated the Ras Muhammad area of the Red Sea, at the southern tip of the Sinai Peninsula, the country's first national park. The legislation was passed thanks largely to the efforts of Dr. Clark, and at the urging of those she has recruited in her crusade to preserve this "vibrant underwater realm."

The legislation will guarantee that unfettered commercial development will not threaten the beauty of Ras Muhammad in the future, that its resources will be managed wisely. But, says Clark somewhat sadly, although still magnificent, the area is not what it

Above: Seven house sharks patrol the reefs of Ras Muhammad.

once was, and never will be again. And there is so much more work to be done.

The Red Sea, a body of water the size of California, lies between Egypt and Saudi Arabia; to the south, beyond the Strait of Bab el Mandeb, is the Indian Ocean, of which the Red Sea is an arm. The Mediterranean is to the north, through the Gulf of Suez.

The Sinai slices into the Red Sea, a giant wedge bounded by the Gulfs of Suez and Aqaba. At its southernmost point is Ras Muhammad (head of Mohammed), roughly fifteen square miles of stark and forbiddingly beautiful land, as prolific and varied below its surrounding waters as it seems barren above. Rarely does a ripple disturb the surface of the water.

"It's a wonderful place," Dr. Clark says of Ras Muhammad and the "easy, beautiful wall diving" there. Maybe the most spectacular of many spots in the Red Sea, Ras Muhammad lies at the juncture of two gulfs and the deep Red Sea,



Dr. Eugenie Clark helps avert an environment Mideast crises

and thus a diver is likely to find him or herself not only in the company of shallow reef species, but pelagic creatures as well. Two-thousand-year-old corals surround Ras Muhammad's two-hundred-foot cliffs. A wall begins as shallow as five feet, dropping off in some places to more than 230 feet. The variety of fish to be seen in one place—from clown fish to whale sharks—is astounding.

Clark's relationship with the Red Sea began in the 1950s when, as a recipient of a Fulbright Scholarship ("I thought, 'Why not apply?'" she relates) she spent a year at "a charming little marine lab," the Marine Biological station at Ghardaqa, Egypt. "Now that town is all built up," she says of Ghardaqa regretfully. There she studied a group of fishes that included the puffer fish and trigger fish, and collected samples of poisonous fish for the United States Navy. Between her work for the Navy, and fish she collected for the United States National Museum, Clark gathered more than three hundred species that year.

Sponsored at various times by the National Science Foundation, the Smithsonian Institution, National Geographic Society, and others, Clark has returned to the Red Sea again and again. At times she has worked from Ghardaqa, other times from Hebrew University's Heinz Steinetz Marine Biological Lab at Eilat, Israel. She studied garden eels, *Gorgasia sillneri*, in the Gulf of Aqaba. These thin, three-foot-long creatures seem to be attached to the sea floor by the tip of their tails. The Moses sole is another Red Sea resident which has attracted Dr. Clark's curiosity and attention, and she has performed many experiments with these flatfish, which secrete a natural shark repellent.

Clark has stated on several occasions that she would rather dive Ras Muhammad than anywhere else in the world. The area is biologically attractive "because of the concentration," she says. "Everything is in one spot." Australia's Great Barrier

Reef may support a greater total number of life forms, Clark notes, but if one were to compare similar-sized portions of each reef, there would be more life at Ras Muhammad, even though Australia has more over all. In addition, she points out, the Great Barrier Reef is harder for most divers to reach than is Ras Muhammad, a fact that places the latter spot in great jeopardy.

"Ras Muhammad is endangered because people can get there so easily. It has become a mecca for divers." That is why, Clark says, "it is important to delineate an area that you can save."

The difficult task of preservation has been further complicated by the sensitive political situation in the Middle East. Israel seized the Sinai during the Six-Day War in 1967. In the years that followed the environmentally conscious Israelis developed diving resorts mostly along the Gulf of Aqaba, at Sharm el Sheikh, northeast of Ras Muhammad. For many Asian and European divers, the Red Sea became a sort of Middle Eastern Caribbean—the diving destination.

The Camp David peace

accords gave the Sinai back to the Egyptians, who assumed control of the last section in April 1982. The eyes of the environmental world turned to the Red Sea. How would the transfer affect the natural resources? Would commercial development ruin Ras Muhammad? Would seismic testing be allowed to destroy large portions of the coral reef? Would oil and chemical spills wreak havoc on marine populations?

"With the new legislation, there's a whole new outlook in Egypt on conservation," Clark observes reassuringly. "They realize their economy could depend on how well they protect these resources." Environmental protection is not a luxury for a relatively poor country, she answers when the question is posed, "not if you're going to protect a goose potentially laying golden eggs for tourism." What is important, she adds, is that funding for such projects not take away from monies to be used for health care and other needs.

Ironically, Egyptian awareness of the importance of Ras Muhammad almost subjected the reef to damage when the government decided to hold a large fishing tournament there to commemorate the anniversary of the return of the Sinai to Egyptian control.

Clark, envisioning the destruction anchors could cause if thrown into the coral, went to the hotel where officials and fishermen were staying the night before the tournament. Prime Minister Sayed Marei was in charge of the affair.

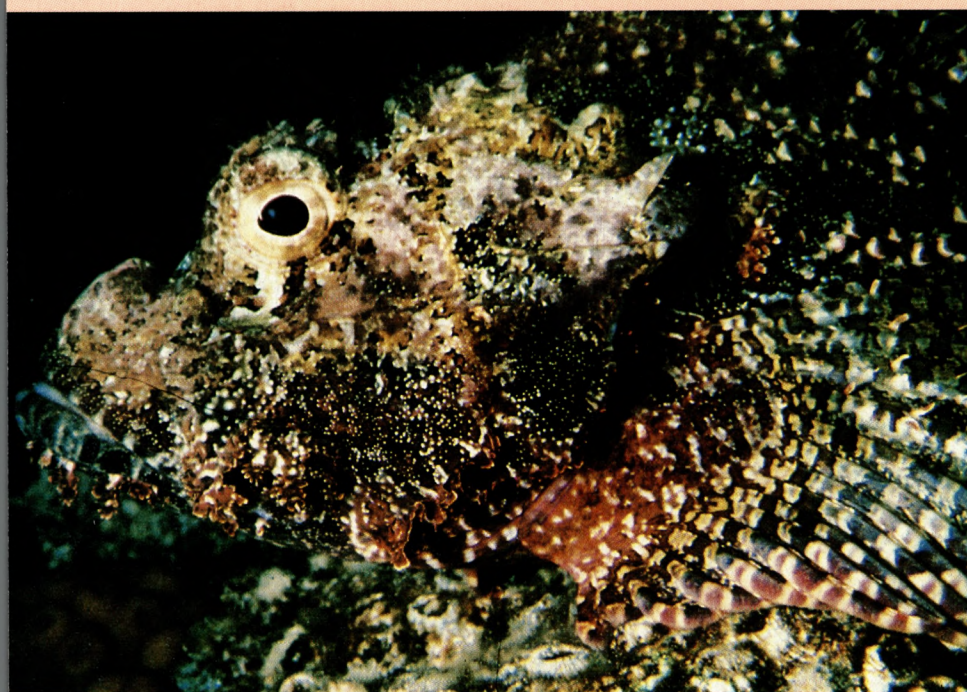
"I went up to Sayed Marei," Dr. Clark recalls, "and I said 'I'd like you to stop the fishing tournament at Ras Muhammad.' He looked amazed that anyone would be so bold," she chuckles. But as she unfolded her story he listened. The next day Marei declared that the tournament would be held further offshore, where no damage could be done.

Marei told Clark that the event was originally to be held at Ras Muhammad because the late



Photo: Cathie Cushman

Above: Dr. Eugenie Clark, 61, began her studies of the Red Sea in the 1950's.



Top: Photographer R. Ingo Reipl won the Hans Hass medal with this shot of a trigger fish. Bottom: Scorpion Fish.

President Anwar Sadat had advised Marei of what an important and beautiful area it was. As early as 1979 Sadat had planned to make Ras Muhammad a national park by presidential decree--at Clark's urging.

Clark met Sadat through his son Gemayel, an avid scuba diver. At the Sadats' home one morning she told Gemayel of Ras Muhammad's importance and of the threats facing it. "You'll have to

tell that to my father," Gemayel said, summoning the statesman. Clark was slightly flabbergasted.

"I didn't think it would be so easy to meet him. If I had asked for an audience I probably would never have met him." When Sadat entered the room, "he looked like a TV set walking in, he looked so familiar," Clark relates. "He was absolutely charming. He said, 'How nice of you to be wanting to do something for Egypt.'"

Sadat promised to declare Ras Muhammad a national park, but on one condition. Gemayel wanted to dive Ras Muhammad, where sharks are a common sight. Sadat told Clark, "I want you to protect my son from man-eating sharks."

"I told him the sharks are my friends," says Clark, author of *The Lady and the Sharks*. "He had a great sense of humor." Sadat's untimely death at the hands of an assassin put a temporary end to plans for a national park at Ras Muhammad. When the idea was presented to Parliament, they answered, "We cannot establish a national park because we have no national park system." Finally, with the backing of Sayed Marei, the bill was pushed through. "It was really amazing, the way they got it through," Clark notes. "In one long session they set up a National Park System and declared Ras Muhammad its first park." The region is protected now, "at least on paper."

The Red Sea "is perhaps the most extraordinary large body of water on earth!"

Despite the legislation, Clark is not content to leave Ras Muhammad on its own. "Somebody has to be there all the time pushing and working," she insists. There are more steps to be taken--an application is being prepared asking UNESCO to name Ras Muhammad a World Heritage Site, and plans for interpretive and educational facilities are being discussed. "At the earliest it will be two or three years before buildings will start to go up if everything goes well," Clark says. "I can see there might be more stumbling blocks."

But Moses wouldn't let the Red Sea stand between his people and safety, and it seems unlikely that Eugenie Clark would allow mere "stumbling blocks" to threaten Ras Muhammad. ■

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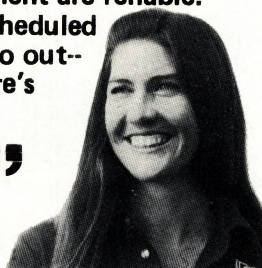
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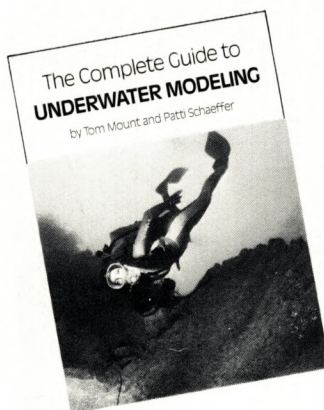
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Gearing Up



4-Way Stretch Fabric Introduced

Parkway has introduced a new 4-way nylon-neoprene laminate, called Thermoflex, for use in its new Plush Suit and other watersport exposure garments. Made of a combination of neoprene rubber and knitted monofilament nylon, Thermoflex stretches equally in all directions, at once.

The Parkway Systems Plush Suit also has a new plush-pile lining which slips on easily even when wet. It dries quickly, and resists perspiration and chlorine stains. The Suit is available in farmer john or high waist styles with separate front-zipper jacket, for men and women. Farmer John suits and pants have Velcro-fastenings for shoulder and tailflap. Features include triple-bonded lock-stitched seams, knee pads, full tape reinforcement, and non-corrosive Delrin jacket-zipper. Color is navy with royal blue lining.

Prices start at \$250 for the Plush Suit farmer john suit and jacket. Contact: Parkway Systems, 241 Raritan St., South Amboy, NJ, 08779; (201) 721-5300.

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Oceanic's new 3000 series strobes are loaded with impressive features, designed by and for underwater photographers to take extraordinary pictures...easily. Features include power output to 150 watt seconds--guide number 85; beam angle, 110 degrees; recycle time .5-3 seconds; and the number of flashes from 350-650.

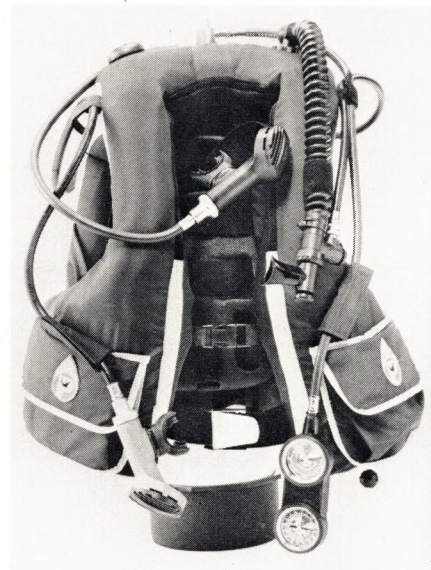
Available with slave or automatic mode factors, each are system compatible with your housed or Nikonos camera system. Contact: Oceanic/USA, 14272 Catalina St., San Leandro, CA 94577

Unisuit Has New Features

Several new dry protection comfort features have been added to Parkway's popular Unisuit this year. Made of neoprene nylon lining, the suit has been redesigned to eliminate crotch and underarm seams, relieving stress. Wrist seals have a new tapered shape.

The Unisuit has Cylolac buoyancy control valves, neck seal and airtight front to back zipper. Unisuit accessories include dry mitts, air supply hose, silicone spray, beeswax and carry bag.

Available in six standard sizes in blue, black or orange. Contact: Parkway Systems, 241 Raritan St., South Amboy, NJ, 08879; (201) 721-5300.



Parkway Improves Ocean Jacket

The Ocean Jacket, Parkway's total buoyancy compensator system, has several new features. The inflator hose and O/P valve have been moved to the top of the shoulder for better access. Shoulders have a new contour shape, and a Fastex buckle has been added to the chest for easy snap-on. The system provides 44 pounds of lift.

A Quick Dump valve has been incorporated in the oral inflation hose. The Ocean Jacket, made of nylon with reinforced seams, has a 15-mil polyurethane zip-out bladder. Other features include Velcro tabs to hold regulator, octopus and gauge hoses out of the way, and self-draining pockets. Color is blue with silver trim.

The Ocean Jacket system includes BC vest, power inflator and backpack, and retails for \$320. Contact Parkway Systems, 241 Raritan St. South Amboy, NJ, 08879; (201) 721-5300.

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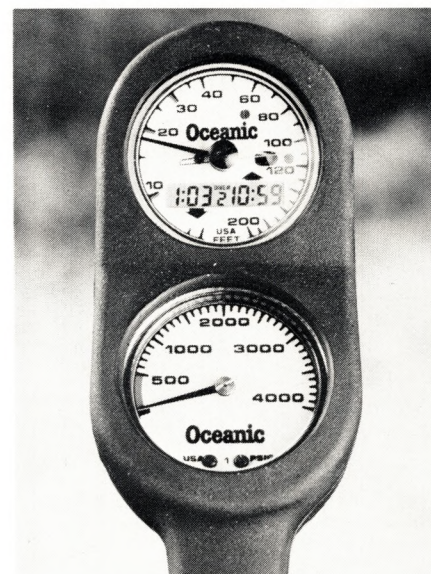
Aquatronics presents the Down Buoy, a new concept in diver-down flags. Constructed entirely of PVC plastic, the buoy's unique design allows it to be collapsed to 24 inches, yet the spar buoy is almost 7 feet long when deployed. It assembles in seconds.

The Down Buoy comes with a standard 14X16 inch diver-down flag, with wire stiffeners and grommets. Contact: Advanced Technology Research Laboratories, Ltd 564 K General Washington Dr., Alexandria, VA, 22312; (703) 750-2920.

New Masks by Dacor

Dacor's new Tri-Vista dive masks feature three lenses integrated into a lightweight frame for wide-angle vision. The masks have a 'Sure Seal' skirt which fits any face like a custom made model. A new patented slide strap adjustment locks in a comfortable fit, and is easy to maneuver.

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What's Up

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For centuries man had felt a spirit of kinship with dolphins. Recent research has made us respect these magnificent mammals even more.

Friends of the Sea, a Connecticut-based non-profit organization dedicated to studying dolphins in their natural habitat, is inviting public participation in a segment of their field work. The group will be studying dolphins off the Florida coast and in the Bahamas from April through October. Educators, scientists, and other professionals are encouraged to contact the organization. In June, divers, swimmers, and other interested parties are invited to join.

Research projects will include identifying individuals and families, recording vocalizations and behavioral observations, and studying area movement and sound repertoire.

For more information contact Friends of the Sea at P.O. Box 2190, Enfield, CT, 06082, or call (203) 623-0157.

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Divers interested in the new CSD program should contact The Ocean Corporation, 5709 Glenmont, Houston, TX, 77081; (713) 661-0033.

Continued on page 49

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ADVENTURE IN THE NORTH

What A Wreck!



Article and Photography
by John C. Fine

Scapa Flow. The name is enough to occasion excitement among divers and historians. An anchorage used throughout history to conceal the minions of war, Scapa Flow has become a cold-water shipwreck diver's paradise. The Flow is located in the Orkney Islands, about an hour's flight from the northern Scottish city of Aberdeen. Flight attendants welcome passengers with "hot butterys" and plenty of coffee and tea.

There is a friendliness in the Highlands and Islands of Scotland that is as evident as the craggy cliffs and lashing sea as one lands at Kirkwall airport on Pomona Island, better known as the mainland.

The Orkneys consist of about seventy islands between the Atlantic Ocean and the North Sea. Once Viking strongholds, the islands now are mostly inhabited by fishermen and farmers. The chain surrounds a deep natural bay used since early times to protect convoys and provides an anchorage for warships.

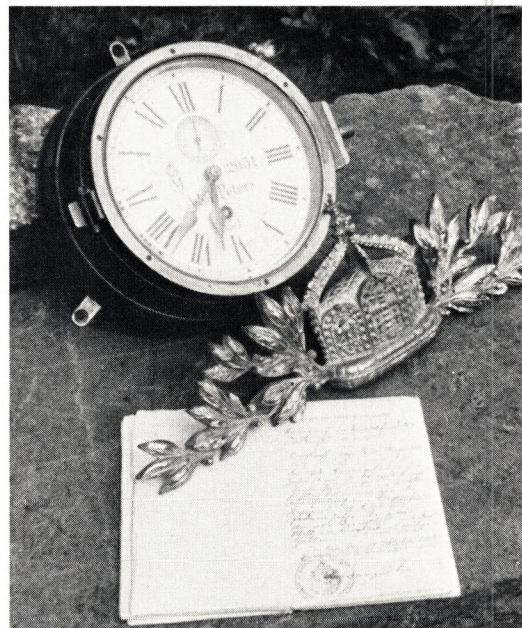
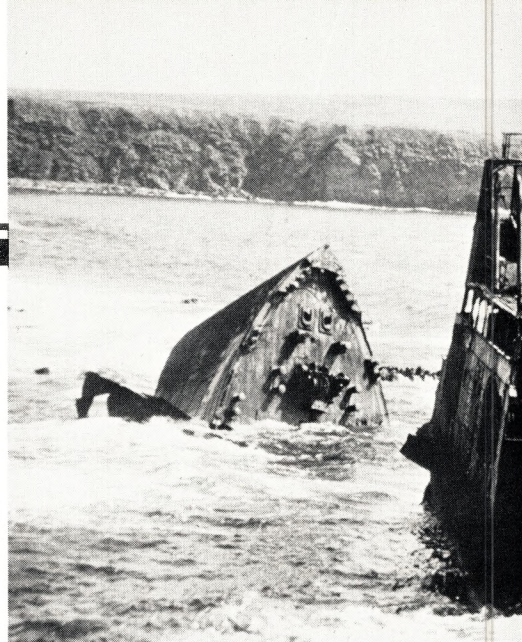
On the Island of Hoy, stone Martello towers, built in 1813, guard the entrance to Longhope Bay, a convoying place for ships crossing

the Atlantic to America during the Napoleonic wars. Nearby is the naval cemetery of Lyness where dead from the German Imperial Fleet, which was scuttled in the Flow in 1919, are buried. Sailors who perished in the *H.M.S. Vanguard*, which exploded in the Flow killing more than a thousand men in 1917, and men from the *H.M.S. Royal Oak*, sunk in the Flow by a German U-boat in 1939, are buried in the cemetery, as are victims of the *Hampshire*, which apparently struck a mine and sank while carrying the famous *Kitchener* to Russia.

John Thornton navigated his 50-foot former pilot boat against the Lyness docks. Thornton is a 28-year-old Yorkshire man who learned to dive in the Midlands. He came to Orkney one summer to work on a farm, liked it so much that he decided to finish at a teacher's college, then moved to Kirkwall to start a dive-charter business.

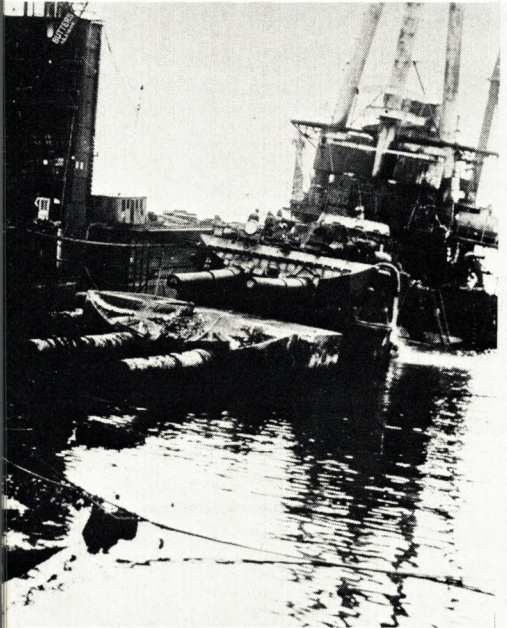
He took us to Lyness at the beginning of the week, after a first dive to get oriented and unsnarl the kinks in camera and dive equipment. Huge fuel tanks and abandoned cement bunkers attest to the use of the spot as a major fleet resupply depot during both World Wars. The old naval base is by and large abandoned now, but on a hill overlooking the Flow where the sailors perished, the neatly kept naval cemetery is a stark reminder of acts of warfare that took place within view of this spot.

Mason "Randy" Logie, an inveterate shipwreck diver from New Jersey, was one of the first Americans to discover the excitement of diving in Scapa Flow. "I was on Charlie Stratton's boat diving with a dentist off New Jersey. He mentioned that he read about them opening up Scapa Flow to divers. They were just diving on World War I German Imperial Fleet wrecks that were scuttled there. I got the information and went over that summer. That's how I met John Thornton," Randy said.



Since his first exciting dives in the Flow, one of which resulted in finding two brass sextants bearing the Imperial German Navy crests, Randy has been returning each year with groups of divers to share the excitement of exploring the last seven battleships and cruisers on the bottom of Scapa Flow.

Thornton's first dive in Scapa Flow was in 1979. "It was on the *Karlsruhe*. The line we put down went right into the engine room. I went straight down the line. It confused me at first, the ship was so big," he explained. John's first reaction is typical of divers' first experiences on these ships. Each wreck is a huge city, five to six hundred feet long—battleships that displaced 25,000 tons, smaller 6,000-ton displacement cruisers, crewed with upwards of a thousand men. They remain unsalvaged



Left: The wreck of the Irene, a freighter that went on the rocks during a storm. Bottom Left: Artifacts from the sunken fleet include a German sailor's log book. Bottom Right: The battleship Hindenburg breaking the surface.

sides in this famous naval engagement, Germany and England both claimed victory. The battle was indecisive. After Jutland, the German Fleet holed up in port and did not venture forth. After the November 1918 Armistice, 74 ships were steamed across to Scapa Flow where they were interned pending the outcome of peace negotiations.

German sailors had revolted. Many of the ships were managed by a committee of Communist workers. The interned ships were not yet officially surrendered, thus no British guards were permitted on board. Chafing under the onus of dishonor, watching the undisciplined crews refuse to obey their officers, German Fleet Commander Admiral Ludwig von Reuter decided that the only valorous escape was to scuttle the ships.

On June 21, 1919, when the British naval squadron sailed out of Scapa Flow on routine exercises, Admiral von Reuter hoisted a signal from his flagship, putting into operation a pre-arranged plan to scuttle the fleet. Shortly after noon, the first of the large German battleships sank beneath the Flow's green water.

Confusion reigned as German sailors sabotaged valves and watertight compartments, hastily abandoning their sinking ships. Some German sailors and the captain of the battleship *Markgraf* were killed by British patrollers. In due course all of the 74 German warships either sank, turned turtle and capsized, or filled with water and ran aground in the shallows.

In the 1920s salvage operations began. All but seven of the sunken ships were raised and broken up for scrap. Of the High Seas Fleet, only the battleships *Kronprinz Wilhelm*, *König*, and *Markgraf*, and the light cruisers *Brummer*, *Köln*, *Dresden*, and *Karlsruhe* remain in Scapa Flow.

The *König* lies on a slope on her starboard side and is virtually upside down. It is about 60 feet to her shallowest part and about 125

feet to the sand. The large 12-inch forward guns are visible under the bow, although the wreck has been blown apart amidships to permit random salvage of the boilers and non-ferrous metals.

The battleship *Markgraf* sits in water 145 feet deep; it is 80 feet to the wreck's shallowest part. The ship is upside down, as is the battleship *Kronprinz Wilhelm*, which lies in 60 feet of water at the shallowest and about 132 feet at the deepest portion of the wreckage. The mast and spotting top of the *Kronprinz* lie in the sand beside the hulk. The midships sections have been pretty much blasted apart by salvors.

The cruisers are photogenic and interesting wrecks, and provide good starting points for divers getting acclimated. The *Köln*, sitting on its starboard side in 55 to 110 feet of water (there are 10-foot tides so depths may vary somewhat), sports a war bridge with a large trajectory finder on top. Oblong viewing ports in the heavily armor-plated structure give it the appearance of an armored car.

On the *Dresden*, lying on its port side in from 60 to 110 feet, divers swimming along the flank can look into a room with a row of urinals still attached to the bulkhead. The muzzles of the *Dresden's* guns protrude from their mounts facing off into the green, bright sea anemones growing off the hull.

The light cruiser *Brummer*, on its starboard side in from 55 to 105 feet of water, is quite photogenic. Square windows on the bridge enable divers to frame each other in pictures and to explore the bridge areas. Beneath the bridge, iron stairs lead down to a room partially buried in silt. The entrance to the room is blocked by two operating tables, indicating that the place served as the ship's hospital.

The *Karlsruhe* is the shallowest wreck, lying on from 45 to 85 feet of water, over on its port side. Unfortunately a lot of blasting for

Continued on Page 51

because they were scuttled in relatively deep water.

Even though the Flow is unpolluted and clean, visibility depends on plankton bloom and sunlight, although 30 feet is typical. The water temperature ranges in the low 50s, even in summer. The three battleships are sunk upside down, some at an angle, making exploration possible once a diver gets oriented. The four cruisers lie on their sides and provide easier access.

Germany's High Seas Fleet really only did battle twice during World War I. The first engagement with the British was in the Dogger Banks when they attempted to scatter English fishing boats. A major battle, the Battle of Jutland, was fought on May 31, 1916, some 75 miles off the German coast. While many ships were lost on both

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What's Up

Continued from page 43

Summer Snapshot School

Picture yourself in St. Thomas this summer, photographing magnificent wrecks and colorful marine life. Jim and Cathy Church are offering week-long and ten-day courses in underwater photography throughout the summer at Villa Olga.

Courses cover equipment selection and maintenance, photo composition, natural and strobe lighting, wide-angle and close-up photography, night photography and more. Three to six days are spent on the live-aboard dive boat *Mohawk II*, where students can expect to shoot at least four or five rolls of film a day.

For a free 12-page brochure write to Jim and Cathy Church, P.O. Box 80, Gilroy, CA, 95021-0080, or call (408) 842-9682.

Eye of the Sea Opens

Underwater photographers won't have to rough it in Roatan. Anthony's Key Resort has opened The Eye of the Sea, a dockside darkroom providing overnight processing and Ektaflex color printed from slides. The facility also rents Nikonos cameras, as well as strobes, filters, and macro lenses.

Resident Photo Pro Charlie Kafer offers classes in both above- and underwater photography. For more details, call or write: Anthony's Key Resort, P.O. Box 26556, Minneapolis, MN, 55462; (800) 328-0734 or (612) 546-8461.

The More, the Merrier

This year divers are expected to spend \$500,000,000 on travel. No wonder dive travel-oriented firms such as OceanQuest are taking the travel market by storm.

Ironically, tough economic times were actually good for traveling divers, according to OceanQuest President Frank Shane. "The recession made divers better dive travelers—they asked more questions, expected a higher quality vacation for the dollar, and demanded good service with follow through."

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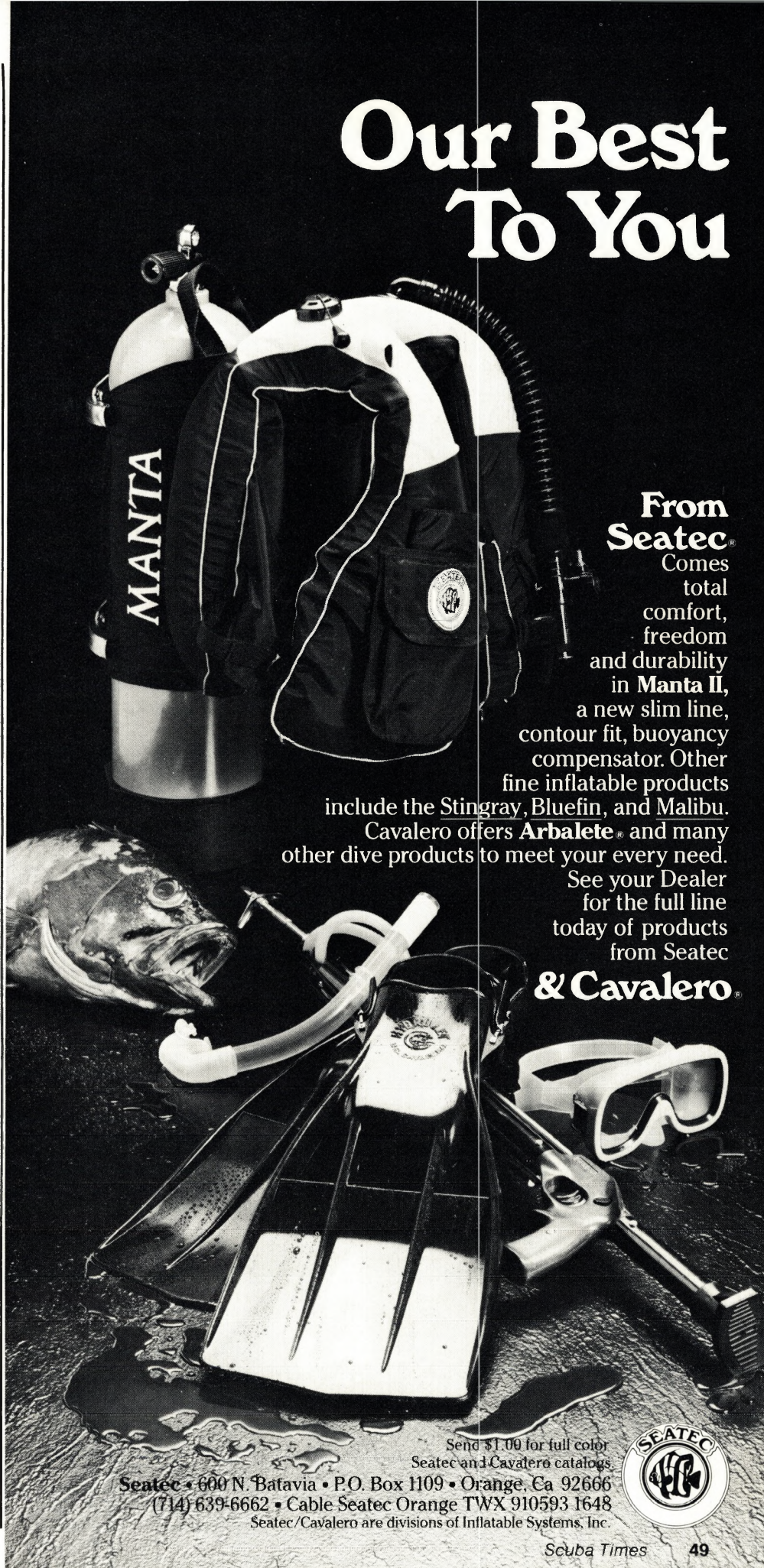
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NOAA Stays Dry

Continued from Page 13

buckles. Fin keepers also are recommended, especially on looser fitting suits.

Front-mounted BCs should not be worn with any drysuit. A backpack-mounted BC or stabilizing jacket is recommended for use with non-neoprene drysuits, but they must not interfere with suit valve operations.

Suit buoyancy should never be used for lifting. Dropping the load guarantees a lightning ride to the surface with the real possibility of embolism. Lifting always should be accomplished using a separate lifting device. (This is just as true when diving with traditional exposure gear; don't use a BC for extra lift, either.)

Neoprene drysuits require extra weight, but generally much less than even experienced drysuit divers tend to use. Weights should be adjusted for eye level float on the surface with empty suit.

Seal and zippers are the secret to a dry dive in a drysuit. Proper maintenance includes silicone spray on the wrist and neck seals and on the sealing surface of the zipper just before donning the suit. Occasional bee's wax or paraffin on the zipper metal parts also is important. The live rubber parts of non-neoprene suits must be coated with talc or corn

starch before storing the suit.

Air for the drysuit normally can be obtained from the primary air supply. A low pressure gauge must always be used, however, when this is done.

Seals and zipper are the secret to a dry dive in a drysuit. Proper maintenance includes silicone spray on the wrist and neck seals and on the sealing surface of the zipper just before donning the suit. Occasional bee's wax or paraffin on the zipper metal parts also is important. The live rubber parts of non-neoprene suit must be coated with talc or corn starch before storing the suit.

Drysuit diving can be safe and pleasant, especially in the cold waters off the North Atlantic coast and along the entire Pacific coast. The suits take some getting used to at first, and require mastery of some new procedures. But the reward is freedom from distracting cold, and the ability to concentrate on the purpose for the dive.

Anyone wishing further information on the NOAA drysuit tests or the author's drysuit specialty course should contact Dr. R. G. Williscroft at the NOAA Diving Office, N/M015s, 7600 Sand Point Way NE, Seattle WA, 98115-0070. ■

The Caymans

Continued from Page 31

undeveloped as far as nightclubs, etc., so be ready to be satisfied with the simple pleasures.

Little Cayman is said to have been a favorite hiding place for pirates such as Blackbeard. When the British finally located the pirates, they slaughtered more than a thousand of them on the northwest edge of the tiny isle. According to legend, the seas were so thick with pirate blood that the area was named Bloody Bay.

Most diving is off the north shore at present, and the south shore remains largely uncharted. The north shore is renowned throughout the world for its spectacular wall diving, but the island boasts premier reef diving complete with tunnels and crevices, and a good shipwreck. To dive Bloody Bay is an emotional and breathtaking experience. The ledge at 20 feet drops in some places to form awesome overhangs. At Three Fathom Wall in Bloody Bay, the drop-off begins at only 18 feet. Prominent crevices cut sharply into the limestone face of the wall. Huge coral heads of pillar and brain coral flourish at another favorite site, Jackson's Point. The wall begins to plummet downward at 35 to 45 feet, and out from the wall, visibility becomes irrelevant. Each diver can create his own fantasies. Who knows what marine creatures may appear out of the rich, blue-purple depths?

The shallows above these three sites are perfect for diving and snorkeling alike. There is an abundance of colorful reef fish, staghorn branches, and almost any other kind of hard or soft coral imaginable. Off the south shore, the intact wreck of the *Soto Trader* lies upright on the bottom only 50 feet below the surface. This island freighter is similar in appearance to the *Oro Verde* in Grand Cayman, only smaller.

Since the birth of scuba diving, man has been attracted by the mysteries under the sea. Although the ocean's mystery has remained sweetly unchanged, my affinity for these waters, and my respect for these three islands and their people have blossomed with each return. ■

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ADVENTURE

Continued from Page 45

non-ferrous metals has rendered parts of the *Karlsruhe* a twisted mass of steel. Ling, cod, stone crabs and lobster abound on the wreckage, which, like the other ships, is bedecked with colorful sea anemones, sponges, and cold-water algae.

The shipwrecks in Scapa Flow provide a unique opportunity to dive into history. A visit to the Stromness Museum, where many artifacts from the salvaged German ships and photographs of the scuttling are on display, adds a dimension of understanding about Orkney's maritime history.

The Orkney Islands provide a magnificent setting for any dive vacation. Non-divers can rent cycles or a car and tour the cairns, Stone Age burial mounds, or ancient villages built by primitive peoples some five thousand years ago. With regular direct flights from all major cities via British Airways and easy connections from London to Aberdeen then Kirkwall on Orkney, Scapa Flow has become as accessible and (with the present bargain airfares) as comparably priced as many less glamorous diving holidays. Just across the North Sea from Norway, the Islands are blessed with long summer days. It stays light until midnight during the latter part of June when Scottish residents go out for their traditional midnight golf game. Even so, the weather is changeable and when the sun ducks under the clouds, the summer temperature is in the cool 60s.

Diving Scapa Flow is a special adventure, as is the beauty and charm of these northern Scottish Isles, where history merges with majestic seascapes, sunsets, and rainbows. Seals and dolphins frolic in an emerald sea. Time is only relative. For the underwater explorer at least, the passage of time has made the last remnants of the German High Seas Fleet capsules of a bygone era. The Orkneys are special islands where the chance of real discovery adds to this great adventure in the North.



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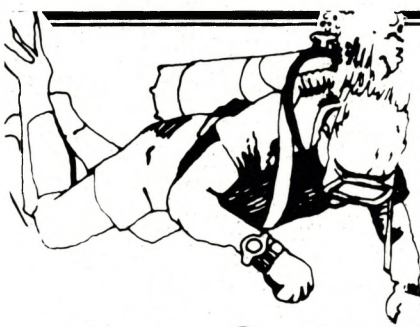
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What's Up

Continued from page 49

HUPS Festival

The Houston Underwater Society's 1984 Film Festival and Photo Competition will be held June 9 and 10 at the Hyatt Regency Hotel, Houston, Texas.

Sponsored jointly by HUPS and the Kenlee's Scuba Centers, the event includes a Film Festival, exhibits, seminars on diving, and an introduction to Scuba in the Hyatt's pool. HUPS will also host a 2-day intensive Underwater Photography Seminar with "hands-on" training conducted by Stephen Frink.

The photo competition is open to all. Categories include Novice Slide Open Slide, Novice Print and Open Print. Deadline for entry is May 31, 1984.

The Film Festival will feature the most recent offerings of nationally recognized underwater cinematographers. Stephen Frink will present a multiple-projector, sound-synched slide program. Ron Coley will also be highlighted with a screening of his San Marcos River chronicle, "River of Innocence".

All events are open to the public June 9 and 10. To obtain photo entry blanks or more information, contact: HUPS Festival, P.O. Box 270056, Houston, TX, 77277; (713) 661-6080.

YMCA Underwater College

The Underwater College at the National YMCA Center for Underwater Activities in Key West, Florida is conducting Summer Sessions for certified divers interested in YMCA Scuba Leadership.

The sessions, this May and August, provide a rare opportunity to proceed directly through the YMCA's continuing education program. Practical experience in diving, diving supervision and instruction are provided in a curriculum which also includes academic training and student/candidate evaluation. The course schedule includes Diving First Aid, Scuba Lifesaving and Accident Management (SLAM), Diver Medic, Assistant Instructor, Silver Star Instruct. For additional information contact: YMCA Underwater College, P.O. Box 1547, and Crossover Instructor, Key West, FL, 33041; (305) 294-5288.

UNDERWATER '84'

The 18th Annual UNDERWATER '84 is coming to Boston, MA April 28, 1984 at the Copley Plaza Hotel.

This years attractions include Paul Tzimoulis-Publisher of Skin Diver Magazine, displays, and seminars on The Monster

in Lake Champlain, The Truth About the Alpha Flag (you don't have to tow it!), Hunting New England Shipwrecks, The Diving Seals on Antarctica, New England's Own Recompression Chamber, Norine Rouse-Lady and the Turtles, and more.

The show will be conducted in support of the new England Hyperbaric Center at the University of New Hampshire, a recompression chamber available to all divers.

The 1984 Ken Read Memorial U/W Photography Contest will be held in conjunction with UNDERWATER '84. Deadline or entries is April 6. For contest information, contact: Bob Pantzer, 171 Witcomb, Littleton, MA, 01460.

Tickets are \$7 and are available at the box office on the day of the program, in advance at various dive shops, or by writing: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, MA, 02117. Make checks payable to "Underwater".

OCEANFEST '84'

This 3-day celebration of our oceans' recreational benefits is coming to Miami's Dinner Key Auditorium April 20-22. In addition to over 200 exhibits displaying scuba equipment and

services, oceans travel and more, OCEANFEST will feature an island seafood festival, marine arts show, the Rick Frehsee School of Underwater Photography, live music and 4 continuous running theatres. Thousands of dollars in door prizes will be given away, including a trip for two to Australia. Also appearing will be oceans explorer Jean-Michel Cousteau, astronaut Scott Carpenter, and U/W cinematographer Jack McKenney. Recording star Jimmy Buffet will appear as Chairman of the "Save the Mantee" Committee. A portion of the OCEANFEST proceeds will be donated to the Committee for further education and research about manatees. OCEANFEST is part of Oceans Miami '84, a 9-day festival of the sea sponsored by the International Oceanographic Foundation and Planet Ocean.

For information contact: Planet Ocean, Rickenbacker Causeway, Virginia Key, FL, 33149; (305) 361-5686.



Diving Jitters

Why Unwarranted Fears Aren't So Irrational

Article by Walt Hendrick, Sr.

Instructors anticipate that new divers will be excited and somewhat nervous about making their first "deep" dive. Students sometimes withdraw and are reluctant to become involved in small talk; some chatter and make jokes to reduce stress, more time than usual is devoted to pre-dive equipment checks. As divers, we tend to demonstrate these behavioral patterns whenever we reach beyond proven expertise and pursue new challenges to grow. It's normal.

In fact, overt excitement, enthusiasm, even pre-dive jitters are not necessarily undesirable emotions. They increase sensitivity and awareness and can significantly enhance the sweetness of success. Part of healthy psychological readiness is understanding and accepting these emotions as normal. Certainly, they are not to be feared as harbingers of something terrible about to happen.

Unwarranted apprehension, on the other hand, is quite different. Irrational concern for one's safety, when the situation doesn't necessarily call for extra precautions, should never be ignored.

Sometimes experienced divers feel uncomfortable about making a dive. Regardless that they may have logged hundreds of hours under water diving in the exact same place, doing the exact same kind of underwater activity they will be doing today, they have bad vibes and are nervous. For no obvious reason, they are apprehensive.

These feelings of doubt may

be generated by subliminal awareness that the diver's equipment hasn't been adequately checked and maintained for proper performance. It may stem from physiological reasons. The diver's health may be below par. An illness may be coming on. Lack of physical conditioning can contribute to uneasy feelings. The dive plan may be confusing. Irrespective of cause, unjustified apprehension before a dive must be given attention.

Sometimes it's prudent to cancel the dive. When equipment has been satisfactorily checked, the dive is well planned and when the divers are all well and in excellent physical condition, but some intuitive message continues to eat away at their self confidence, abort the dive.

Experience has taught me that to prepare psychologically, I must:

- *Have an acceptable dive plan, one that I am comfortable with, based on my diving expertise,

- *Check all personal diving equipment for proper functioning,

- *Be in satisfactory physical condition to meet the physical demands of the dive and to be capable of coping with any emergencies which could arise,

- *Conduct or participate in a "good" pre-dive briefing and have ample opportunity to check my partner's equipment,

- *Know my buddy and what his diving capabilities and limitations are,

- *Not push beyond safe limits regarding time and depth,

- *Not participate in any dive that I intellectually or intuitively feel is unsafe.

Psychological readiness is more than a positive attitude. A highly motivated diver may inspire another diver to participate in a dive that is well beyond his existing experience and capabilities. He could easily ignore or forget the importance of the above check list. He could have the "right" psychological readiness and not be prepared to make a dive.

Psychological readiness encompasses all of the above. Prepare physically, prepare through good dive planning and you will be better prepared psychologically. A sport diver about to make his first open water dive to a maximum depth of 20 feet should be excited. A sport diver with three open water dives contemplating a dive to 100 feet should be apprehensive. Common sense is alerting him that, perhaps, it's too big a step.

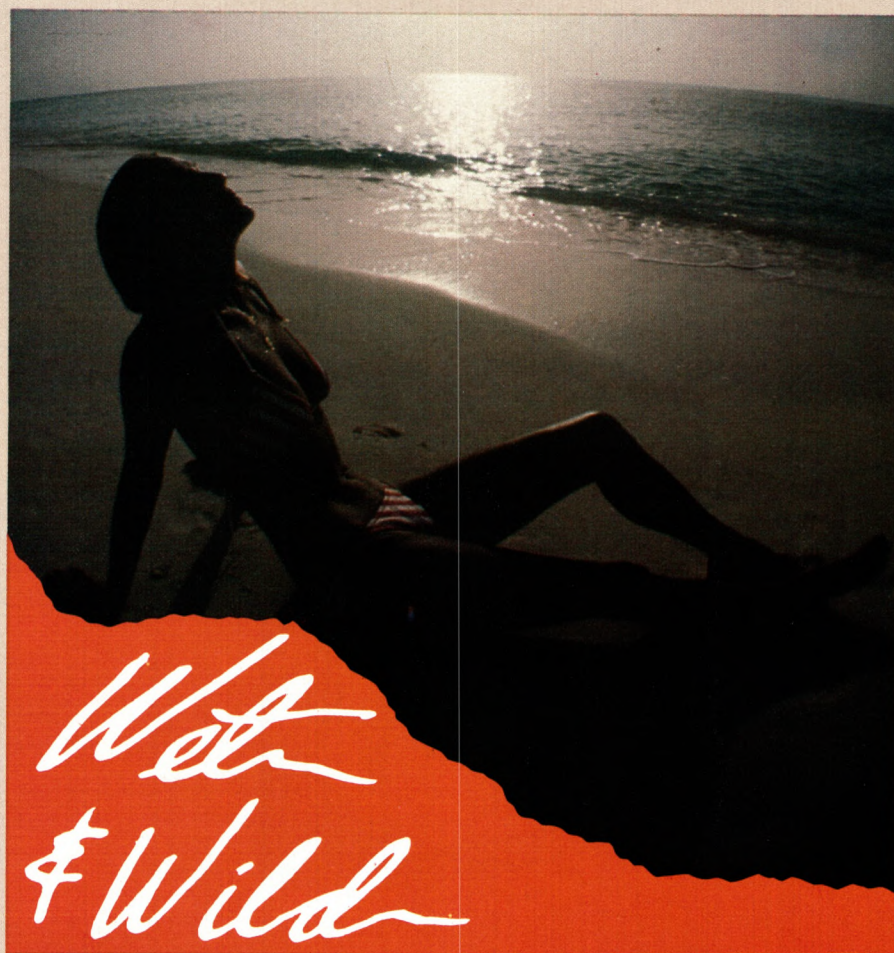
Train well. Maintain your equipment. Keep yourself in good physical condition for the kind of diving you wish to pursue. Plan your dives within your safe limits or seek additional instruction to advance safely. Always know your buddy's capabilities and limitations. Dive when you really feel up to it and want to. Listen to your intuitive feelings. Gain confidence by advancing slowly.

Do these things and you will be psychologically ready for sport diving. And if you're not, perhaps it's best to skip today's dive. ■

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Article and Photography by Bill Lovin

EDITOR'S NOTE: What does a world traveling cinematographer do for excitement when he decides to take some time off from his 'bread and butter' work to pursue his own creative interests? Photographer Bill Lovin decided to make the world's first R-rated diving short film. His experiences during the shooting of his new film, *Moments* are described in this month's column.

The emotions of diving have always fascinated me and have been the subject of most of my underwater filmmaking work. Some years ago I decided to make a film that was devoted to the erotic aspect of diving; a film that would stimulate a new awareness and open divers up to enjoy that sensual feeling.

It turned out to be an idea whose time had not yet come, however, and I had to shelve it for several years while pursuing other more mundane but financially rewarding projects. I began seriously reconsidering the idea in 1981 after I discussed the possibility of doing some shooting

with Dick Batchelder, president of At-Reef Ventures, which represents diving resorts throughout the Bahamas.

Dick is both a dedicated diver and a very fine underwater photographer who thoroughly understands the requirements and problems of underwater movie making. He's also a pioneering force in the diving community who has developed a strong personal philosophy in regard to the underwater world.

Dick immediately suggested San Salvador in the Bahamas as a perfect location for a film project. San Salvador, Dick told me, is strongly oriented toward the underwater photographer. The resort is the home of the Paul Tzimoulis Underwater Photo College and has a spacious classroom/darkroom facility offering overnight processing and year-round photo classes. The dive boats were designed to accommodate lots of camera equipment and the divemasters themselves are photographers who are sensitive to a shooter's

problems and wishes.

I arrived in San Salvador with great expectations, accompanied by assistant cameraman Steven Zarich and diving model Susan Abbott. I'd first worked with Susan in an underwater photo course and found that she was not only a woman of grace and beauty but a thinking diver who understood the beauty and sensuality of the underwater world.

We easily cleared our equipment through Customs and were whisked off to the Riding Rock Inn. We felt almost immediately at home at this small resort, situated only a few feet from the ocean and a short walk from the marina and dive shop.

We met with Clark McCaslin, the divemaster who would be working with us. Clark was an enthusiastic San Salvador diver, and he immediately listed ten dive sites where we were sure to find unusual marine life and spectacular scenery.

Susan and I began working without a hard-and-fast script in mind. We knew we wanted especially to capture the rich, warm colors of the underwater world and the sponge-covered walls and drop-offs of San Sal, as spectacular as any I've seen, provided plenty of that.

Secondly, we wanted to emphasize the fluidity and warmth, the womb-like quality of being in the ocean. We filmed using a constantly moving camera, often completely circling our subjects. Much of our footage was shot on a drop-off called Shangri-la, home of a most affectionate grouper dubbed Ghengis Khan. For Susan and Ghengis it seemed love at first sight and our footage of them together would play heavily in our finished film.

I like to think that we discovered San Salvador's romantic and sensual side, a side long overlooked by most of the divers who visit the island. As I watched our footage over and over again during months of editing I was reminded that the ocean only gives to us what we are prepared to accept.

The nine and one-half minute film, *Moments*, premiered in August 1983 at the Sydney Underwater Film Exposition in Sydney, Australia. To obtain a copy of *Moments* contact: Marine Grafics, P.O. Box 2242, Chapel Hill, NC, 27514. ■



Scuba Chrome International

Services for the underwater photographer

Article by Lynn Russell
Photography by Burton McNeely

Dynamite underwater images fizzle if the colors aren't just right. Even when slides are picture perfect, they can't jump out of their sleeves and sell themselves. But, submarine shutterbugs, don't despair.

There is a unique organization for serious underwater photographers, both amateur and professional. Founded in 1979 by veteran photographer Burton McNeely and Skin Diver publisher Paul Tzimoulis, Scuba Chrome International solved a problem shared by many underwater photographers around the world--

where to find a custom-color lab which could produce quality, accurately processed underwater slides and prints. McNeely's Tampa, Florida-based facility has since grown to serve the needs of approximately six hundred Scuba Chrome International members, spanning the globe from Saudi Arabia to the Bahamas.

As SCI evolved, McNeely developed a number of marketing tools for members based on his twenty-five years experience as a commercial photographer. The first of these tools is the Scuba Chrome Journal, a bi-monthly newsletter for

SCI members. The Journal provides a communication service for underwater photographers which can't be found in any other publication. This full-color newsletter promotes excellence as well as new uses and markets for underwater photos. The Journal has also helped a lot of serious amateurs find occasional markets for their work, a fact which pleases McNeely personally. Jerry Fish of Montrose, California, commented, "Thanks to the Journal, I sold my first underwater slide ever. A firm doing an educational audio-visual show bought several of my slides.

It's encouraging to know there might be a way to support this hobby of mine."

Journal features are written by top professionals in the industry. They describe how they shoot their assignments and what type of equipment they use. In a recent article, Jim and Cathy Church discussed how they shot the latest series of photographs for the Nikonos IV advertising campaign.

Another outgrowth of McNeely's extensive contacts in the publishing industry is the Market Flash. This service, provided to all SCI members, supplies a regular listing of photos needed by publishers and advertisers. Some of the publishers included in the Market Flash are Natural History, Time Life Books, textbook publishers and hunting and fishing libraries.

A specialized part of the Scuba Chrome Journal which McNeely recently added is the Portfolio. This one-page insert is designed for serious photographers who want to publicize their work beyond the obvious dive markets. It is patterned after the Art Director's Index, which provides photographers with one-page examples of their work (for a fee) to be distributed to art directors around the country. The Portfolio provides this service at about half the cost of most full-color, one-page promotions. It supplies up to three thousand reprints for the underwater photographer's personal use in promoting his or her work. Photographer Robert Holland of Miami was recently highlighted in the Portfolio section and, as a result, obtained a shooting assignment with Smithsonian magazine. His work was placed on the front cover of Smithsonian's October 1983 issue. He feels that the Portfolio "provided an opportunity which otherwise would have taken years to achieve."

Margo Nelson, a successful underwater photographer in the Dallas area, was also showcased in the Portfolio and "could not keep up with the offers that came in as a result."

The Marine Gallery division of Scuba Chrome International has enabled members to make use of another profit center for their work.

Interested underwater photographers may sell their photographs as photo decor in a gallery. They receive royalties on photographs sold.

In addition, McNeely has employed a full-time sales staff to expose interior designers, businesses, and individuals around the country to quality sea images. Murals of members' work, eight by ten feet and larger, have been sold also. Preparatory work on the negatives or slides is done at Scuba Chrome's lab. These images are then sent to the 3M Corporation in California, which enlarges the image up to eight by ten feet on canvas, vinyl, or monk's cloth. The process is called Scanamural, and the image is literally spray painted onto a surface while a computer reads the color tones from the slides. James Wedge of the Kwajalein, Marshall Islands, sold a clown fish mural which provided him a sizable royalty. His image was sprayed on a canvas surface and is used in underwater trade shows. A large Scanamural by underwater photographer Steve Lucas is on display at the Miami airport. The image was sprayed on vinyl wallpaper backing.

SCI is far more than a custom-color lab. It is an organization which provides its members marketing information, how-to tips from the pros, publishing contacts and other opportunities. This remarkable organization costs \$25 for a one-year membership and \$40 for two years.

Other considerations are as important to becoming a successful underwater photographer, according to Burton McNeely: "What's the edge? Don't let your ego get in the way. Learn to relate to the outside world in commercial terms. The most important ingredients are professional knowledge and attitude. You must have the knowledge of the equipment to make it happen; but that doesn't make the picture. It's enthusiasm and hard work that put it together." ■

Upper left: Burton McNeely displays 3 different kinds of color print services available from SCUBA CHROME. Bottom Right: A tab technician at work on custom prints.





Barracuda

Article and photography
by Robert Holland

A barracuda's reputation always precedes it. Even the tried and true landlubber knows of the menacing barracuda and its allegedly vicious nature. As divers, many of us see barracuda on a regular basis and there's no disputing that this is a vicious looking fish. Sequined armor adorns its body, allowing perfect midwater camouflage yet flashing brilliance when struck by the sun. A gaping mouth complete with canine teeth and an ever-staring eye give the barracuda a sinister appearance. If they were as mean as they looked, however, there would be fewer of us in the water. Despite their ominous looks and mean reputation barracuda are more fascinating than they are fearsome.

Barracuda are in the family of fish known as Sphyraenidae, with all twenty species of fish belonging to the genus *Sphyraena*. Microscopic when born, barracuda achieve lengths of over five feet and weights near 100 pounds. These measurements are rare, however--the typical adult

barracuda is less than three feet long.

Barracuda live and behave quite differently according to size and age. Young fish tend to prefer non-reef habitats such as grass flats, tidal pools and mangrove-fringed shorelines. Here, they can easily align themselves with a blade of grass or floating debris to remain hidden. While it might seem unusual to think of the mighty barracuda hiding from danger, the young are quite vulnerable and are often found in groups with a rigid pecking order. Each fish might, for example, have a specific position in the group which it returns to after looking for food. These hanging groups of barracuda sit motionless in midwater and are usually little concerned about divers.

Adults behave quite differently than young barracuda and are traditionally associated with coral reefs. Adults travel alone or in groups of two to three as they prowl for food. These are the fish that earn notorious reputations and have the starring roles in countless fish stories. Part of their

precarious reputation is due to instinct. Barracuda are curious fish with little to fear and as a result will swim right up to the diver, inspect him, then drift back to shadow his movement. This is enough to make any unfamiliar diver understandably wary.

Using caution around barracuda is probably a good idea. In some parts of the world they are more respected than sharks due to their more visible presence and a reputation for taking fish from the hands of divers and fishermen alike. Occasionally a diver is bitten, though these rare attacks on humans are usually the result of mistaken identity. In turbid water a wetsuit-clad arm with shiny jewelry could resemble a thrashing, vulnerable fish. A similar mistake could result from a diver holding on to a speared fish. The barracuda could have a difficult time distinguishing between dangling fingers and struggling fish. Most documented attacks fall into one of these categories or are the result of a

barracuda being speared or otherwise aggravated.

The barracuda is a fish you have to respect if for no other reason than its evolution. This fish has evolved to be perfectly adapted to its environment. Its biological function, or "niche", is as a top level carnivore which cruises the reef looking for prey. How perfectly outfitted the barracuda is for its job! Hydrodynamically, barracuda are well designed for speed. Their stiletto-shaped body tapers to a point at the head and is propelled by a strong caudal fin which "snaps" back and forth for quick acceleration. The business end is most impressive. Its jaws are long and pointed and contain two parallel rows of razor sharp teeth studded with two to four canine teeth.

Barracuda are primarily daytime feeders that prey upon moving animals such as fish and squid. While they depend on sight to obtain most of their prey (remember that shiny objects attract these fish) barracuda also use their lateral line to key in on splashing and vulnerable fish.

No matter which sense is used to locate prey, the barracuda's feeding actions are swift and sure. The most common method of capture is to stalk a specific fish, grasp the unsuspecting victim between strong jaws and either slice or fold the creature as it is eaten. A more curious feeding method is employed when attacking a school of fish. In this instance a barracuda might race through the school with jaws agape wounding or severing fish in half before promptly returning to catch the pieces before they hit the seafloor.

My own introduction to the eating habits of barracuda left my jaws further agape than the fishes' own. I couldn't help but compare the situation to a racing pit where sleek and shiny cars were being meticulously attended to by numerous mechanics. As each fish glided under the coral outcropping a team of neon gobies descended from their perches to prune and clean the barracuda of parasites. I watched and photographed with amazement from only inches away. Suddenly one of the barracuda lunged from its midwater resting place right towards my facemask. In a split second the barracuda intercepted and caught a small bar jack which was crossing between us. It was a poor route for the bar jack but a vivid display of predation for me. The barracuda promptly devoured the jack and returned to his pit for continued service.

A barracuda's feeding preference may be the reason for its toxicity. These fish are one of the numerous species of tropical marine fishes known to sometimes have poisonous flesh due to their diet. The form of fish poisoning known as ciguatera is the most common and is thought to originate with specific microorganisms. Fishes which eat these microorganisms may store toxin in their tissue and transfer it to other fish when they are ingested. As a result, high level predators such as barracuda, grouper and moray gradually receive poisons, becoming toxic themselves. Large barracuda (over three feet) are often poisonous when freshly caught, yet there is no way to distinguish toxicity. To further complicate matters, members of the same species caught at the same time and place may show opposite toxicity--in other words, one could be perfectly safe to eat while a second could be poisonous. Ciguatoxic fish are found only on coral reefs, yet infected areas change from season to season with no apparent pattern. The end result is an unpredictable situation in which barracuda may be either delectable or deadly if eaten.

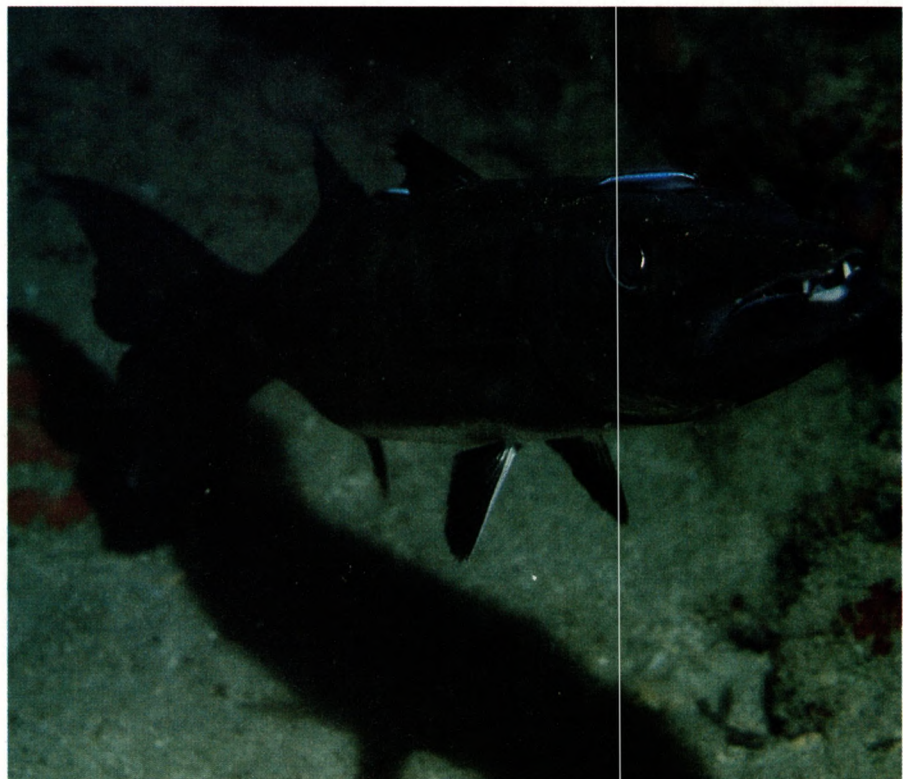
Symptoms of ciguatera are similar to the effects of other poisons and can start with nausea, dizziness and vomiting. Next, nervous sensations such as joint pains and itching occur and sleep becomes difficult. Some

neuromuscular problems can persist for months or even years since there is no antidote. An additional problem exists in that the poisonous toxin accumulates in man just as it does in reef fish. A person might eventually become ill by eating slightly toxic fish over an extended period of time. Over 1,000 cases of ciguatera are estimated to occur each year in South Florida, though the number caused by barracuda alone is more difficult to ascertain.

Historically, barracuda have endured tales which embellished both its toxicity and ferocity. Early mariners knew of the fish and reported lengths of "over 20 feet" and acts of pure vengeance. While these stories are a bit far fetched, those that deal with the poisonous nature of the barracuda appear factual. Early writers accurately portrayed symptoms and long term effects, and even suspected that toxic seas changed from season to season, as we now know.

Whether our interest is stimulated by respect, intrigue or even fright there is a certain fascination that surrounds the barracuda. Their mysterious yet curious nature is sure to captivate divers for generations to come. ■

Previous Page: The "great Barracuda" groomed by a neon goby shows the fishes long canine teeth. Below: The barracuda's stiletto shape is designed for quick movement during attack.



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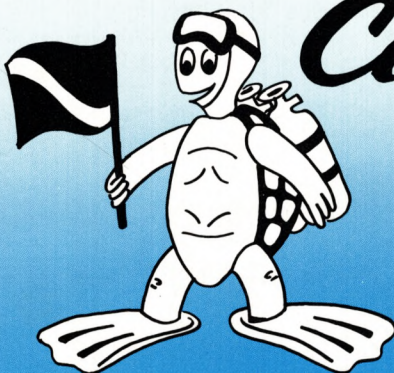
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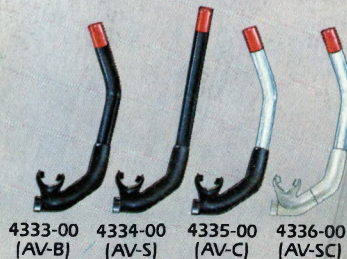
HOW TURBO VENT II SNORKEL WORKS

WATER SURFACE

Water drains instantly at the surface. Minimal residual water volume in mouthpiece.

Small amount of residual water is easily cleared at top and through vent valve.

* Air "deflector vane" prevents exhalation directly on vent valve for effortless, efficient clearing of small amount of residual water in mouthpiece.



- Air "deflector vane" *
- Exhaled air
- Purged water



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Send \$2.00 for Dacor Diver Kit. Includes catalog, cloth patch, decomp. table, decals.